

PRACTICAL HUSBANDRY,

OR,

THE ART OF FARMING,

WITH A

CERTAINTY OF GAIN;

AS PRACTISED BY

JUDICIOUS FARMERS IN THIS COUNTRY.

THE RESULT OF

EXPERIENCE AND LONG OBSERVATION.

BY DR. JOHN TRUSLER.

This Work is composed of all the Knowledge necessary in the practice of Husbandry, unencumbered with Theory, Speculation, or Discrepancy; also, a Number of Observations of the Expenses and Profits of different Crops in the common Way, taken from Meters kept; and a Variety of useful Remarks and new Improvements in Husbandry, not to be met with in any Books of Agriculture.

TOGETHER WITH

DIRECTIONS FOR MEASURING TIMBER.

PRINTED BY THE AUTHOR, with great Attention.

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PRACTICAL HUSBANDRY.

TO FOLLOW THE TITLE.

Written in 1810.

SINCE this edition was printed, the prices of provisions have been considerably raised, and rents have risen in proportion; but this is no disadvantage to the farmer, but on the contrary, an advantage; for though rents are doubled, and the prices of crops almost trebled, those of farming utensils, taken in general, and the price of labour, have not risen in equal proportion—for example:

	In 1799.	In 1810.
A good cart-horse, its price	£20 0 0	£40 0 0
A waggon	24 0 0	35 0 0
A cart	9 0 0	15 0 0
A plough	1 15 0	3 0 0
Pair of drag harrows	2 0 0	3 3 0
Shoeing a horse	0 2 8	0 4 0
Threshing a quarter of wheat	0 3 0	0 3 6
barley	0 2 0	0 2 0

Other work, &c. in proportion.

Notwithstanding these alterations in the prices, it does not destroy the utility of this work; for every one who undertakes a business, must be presumed capable of making allow-

ances in estimates for the rise and fall of particular articles. The estimates here given, are sufficient to lead him in making his calculations; but it may not be unnecessary to say, that a tenant or farmer can better afford to pay his landlord forty shillings per acre for land now, than he could twelve shillings in 1799.

Let us, for example, consider this in a crop of wheat:

Suppose the rent, tythe and taxes to be (per acre) - - - - -	£3 0 0
Other expences <i>double</i> what is stated in pages 19 and 20, which is by no means the case -	5 5 0
	<hr/>
	8 5 0

When the price of corn is considered, which instead of 5s. a bushel, as in page 20, it has been seldom lower than 15s.; but say only 12s.---Twenty bushels at 12s. - - -	12 0 0
One and a half load of straw, at 1l. 16s. - - -	2 14 0
	<hr/>
	14 14 0
Expences as above	8 5 0

It leaves a profit of - - - - - 6 9 0

Whereas in 1799, when rent, tythe and taxes were rated at £1, the profit, as in page 20, was only £2 17s. 6d. The present gains, therefore, on an acre of wheat, exceed what they were in 1799, full £3 11s. 6d.

And as other crops are proportionably increased in price, we may fairly state, by referring to page 55, that as 2l. 17s. 6d. is to £6 9s. so is £395 the nett annual profit of a farm of 150 acres, on an average of seven years, to a given sum. What that sum is, the rule of three will shew:

$$\frac{\text{£} \ 2 \ 17 \ 6}{2} : \frac{\text{£} \ 6 \ 9}{6} :: \frac{\text{£} \ 395}{?}$$

Reduce these sums to 6d. each, and the statement is as follows :

£	s.	d.	Sixpences.
2	17	6	= 115
6	9	0	= 258
395	0	0	= 15,800

State it then as follows :

If 115 produces 258, what will 15,800 produce? This will appear to be rather more than £886.

Of course, taken in a general view, such a farm of 150 acres of good land, as produced on an average of seven years, by the estimate set forth in page 55, a profit of £395 will at the present time, 1810, under equal good management, produce a nett profit of £886; more than double. Hence, the rents, though so much raised; as provisions are raised also, the farmer has more reason to rejoice than complain. It requires, indeed, more money to stock such a farm; but the additional gains amply compensate for an increase of stock.

TO MEASURE HAY IN THE RICK.

Trusses are made $3\frac{1}{2}$ feet long, and $2\frac{1}{2}$ wide, and if the rick hath sweated as it ought, it will be so close, that a truss shall not exceed eight inches in depth: some will be nine inches, and often they are twelve.

But we will suppose the rick in good order, and allow eight inches from the ground to the slope or bottom of the roof, and nine inches from the slope to the top. If a solid cut have been taken from the rick, in proportion to the

produce of that cut, we may come at the exact contents of the remainder; but if not, we must proceed thus:—

Example.

What are the contents of a rick 35 feet long, 20 broad, and 20 high; that is, 10 feet from the bottom to the slope, and 10 feet from the edge of the slope to the top of the ridge?

Now 35 feet contain 10 trusses in length, of $3\frac{1}{2}$ feet each; and

20 feet contain 8 trusses, in breadth of $2\frac{1}{2}$ each.

10 feet to the slope is the height, and contain 15 trusses, of 8 inches deep each.

5, or the half of 10, taken from the slope to the top, will give the average contents of the roof. This is nearly the height of $6\frac{1}{2}$ trusses, at 9 inches deep each. Fractions in so small a rick are not worth notice.

Now multiply the length by the breadth, and the product by the depth or height.

10, multiplied by 8, gives 80 trusses.

80, multiplied by 15, gives 1200 trusses in the first 10 feet, or great body of the rick.

Next, for the upper part,

Multiply 80 trusses, that is, the number in length and breadth, by $6\frac{1}{2}$, and the product will be 520, which added to 1200, gives the contents of the whole, viz. 1720 trusses; this divided by 36, the number of trusses in a load, gives 47 loads, 28 trusses.

Q. E. D.

INTRODUCTION

INTRODUCTION.

of which and of which to make a new and better life.

IT may not be amiss to premise, as an introduction to this work, that the following pages were not made publick with a desire to instruct young men early bred to husbandry; but to give those who may think proper to use a certain quantity of time for amusement or convenience, such an insight into the nature of farming, as will enable them to check the ignorance, correct the ignorance, or detect the imposition, of servants.

There is not a more healthful, rational, or more pleasing amusement in rural life, than agriculture; nor does any one thing, independent of profit from sale, yield a family more conveniences, or in greater plenty, than a farm; but it must be a satisfaction, at the same time, not to pay more for those conveniences than necessary. To those gentlemen who seldom examine their accounts, or look into the application of their money, this treatise will be useless: they take servants with good characters, and to their honesty they trust the whole. Few bailiffs, with a stated salary, are much in their master's interest; they crop the land, perhaps, and possibly keep it in

good condition ; but the expence with which it is done, is no part of their consideration. A farmer's chief gains arise from making his lands produce as much as possible, and doing the busines at as little expence as he can. For this purpose, he takes the advantage of seasons, attends to his team, that his horses are in health, kept so without waste of provender, and that they work a certain number of hours ; he takes care to employ no hands but what are absolutely necessary ; gives no more for labour than his neighbours ; sees that his labourers fill up their time, work their stated hours, and neither rob him of, nor waste, his property ; he gets his harvest properly in, whilst the weather is fine, buys in his stock at the best hand, and gets a market price for all he sells. But, does every gentleman's bailiff do this ? No. His master's eye is seldom upon him ; his account is scarce ever looked at ; and he is found more in the interest of the employed, than his employer. I have seen twenty men in a hay-field, and about a hay-rick, when half the number would have been sufficient ; they have stood in one another's way, and half their time they have been idle ; instead of taking advantage of the dry time, and working till dark, they have quitted at six, and left the rick to the mercy of the weather. This a farmer *never* suffers ; and it is by this, and other things, that gentlemen lose by farming. But, would they occasionally look into the busines themselves, (and none but such can ever expect to profit by it,) they would very soon find their account in it, and it would fill up many a little hour.

To gentlemen fond of riding, without an object in view, even riding becomes irksome ; but, were they, when in the country, to ride about their farm every fine day, each gate opening with a latch ; were they to examine, at such times,

INTRODUCTION.

the improvement of their cattle, the condition of their team and implements, the state of their fences, the cleanness of their grounds, the richness of their meadows, and the luxuriance of their crops; new pleasures would daily rise before them, and their morning's saunter would be delightful. To such persons experiments occasionally made upon an acre or two of ground, under their own immediate direction, would throw new lights upon husbandry, be useful to the world, and amusing to themselves: but to make such experiments of real use, minutes should be kept of every circumstance respecting them; the nature of the soil, the number of ploughings and harrowings, the quantity and kind of manure, the quantity of seed sown, the time of sowing, the weather, the cultivation till harvest, the time of cutting, the produce when threshed, and every other particular; and comparing these at home with former, or similar, crops, would afford no unpleasing amusement in a wet morning. But, whilst I am studying the interest of others, I am forgetting my own. I am finding employment for gentlemen, who may dread employ, and under a notion of recommending my book, I am thus, perhaps, destroying its success. For *any* useful employ to men of fortune, in the present age, is irksome to think of. They waste their important hours, and *fringe away* their life in trifles.

John Fowler
EGHAM, SURREY,

1799.

BY M. TRUSLER.

TRUSLER'S

PRACTICAL HUSBANDRY

THESE being a general rage for Farming throughout the kingdom, among men of landed property, and among others who take it up under a principle of amusement, or gain, the Author of this work flatters himself, the following pages will be very acceptable to the Public; particularly, as the former treatises on farming hitherto published, are so crowded with theory, new experiments, and speculations, that, instead of being useful to country gentlemen, they have served to mislead them; and, after the trial of a number of years, have shewn, that farming, to them, instead of producing profit, has brought on a considerable loss. The fact, in short, is this: such books have induced gentlemen to try new methods, and follow them in all the round of idle speculation, when they should have pursued that plain method which every farmer follows. Thus have they attributed their loss to the dishonesty of servants, which, in fact, arose from their want of knowledge in the business of farming; whereas, had they never looked into such books of agriculture as are now extant, but depended even on the little knowledge and experience of an honest country servant, bred to the plough, they would have reaped an advantage; though not equal perhaps to the farmer who has followed the business his whole life.

To correct these mistakes, and point out that method of agriculture

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culture which every experienced farmer pursues, is the design of this Work; and the Author persuades himself, that, if his instructions are observed and attended to, there is no land in this kingdom but will, while it amuses the cultivator, yield him a considerable profit. He does not wish to deter gentlemen from trying experiments, or following new methods; but, if they wish to profit by farming, such experiments, or new methods, must be made only occasionally. The loss of a few pounds on one acre of land is of no consequence; but when that one is extended to some hundreds, it discourages the enquirer, and leads him to attribute that to the dishonesty of servants, the poorness of the soil, or bad markets, which is wholly owing to experimental enquiry.

C H A P. I.

OF SOILS.

THE first thing every systematic treatise on agriculture teaches the husbandman to enquire into, is the nature of his soil. Whether this consists of marl or limestone, more or less salts or oil, the *tabulum* of plants, to the plain, practical farmer, is immaterial; all that is essential for him to know, is, whether the land be stiff or light, and whether it is best adapted to the growth of wheat or barley. Of this he may instantly judge by his eye, or he may learn it from a sight of the crop, the information of the neighbours, or the trial of one year; and if even reduced to pick up his knowledge from the latter, an indifferent crop for one year cannot ruin him.

Every husbandman knows, that rye, barley, turnips, and clover, will thrive best in a light soil; oats, beans, and wheat, on a stiff or strong one; that strong clayey land will require

winter follows to break and pulverize the soil; and that light, sandy, or gravelly land will want summer follows to destroy the weeds: Since horse-dung is the best manure for all kinds of land, but that clayey land will receive benefit from light dredging, though it be ashes, or even sand; and that light lands may be helped, even by a dredging of clay.

I would, however, advise every person commencing farmer, or taking a farm, to make some little enquiry into the nature of his lands. As he will never jump into a farm readily, without some consideration, I would recommend it to him to take a view of the farm, and to take his horse and cart, and to take possession of it. If the land be poor, the crop will be poor; or, even in the same, the farmer will have to cultivate it rich, the cost of the cultivation will be high, and the cart will be heavy. If the land be good, the crop will be good, the ground a fine crop of wheat, and rich, the cart will be light. If the wheat be full of weeds, it denotes a light poor soil; if full of thistles, a strong, good one. I mention this, as a general rule, but I have no other test, than of a man's Nature, and his knowledge, with which to decide. I would, however, caution him to expect, that no bad master for the year, will do him well. For this year, all he has to do is, to land, and to bring the teams, good heart; (so apt are old teams, though not so good as new, to over-crop it, and neglect to clean it, and to bring the teams, bad heart; of their master, unless he is a bad master, and of some good master, who has a bad heart, and a bad master, of his ground, than any man, for any man, of his heart, and a good master, of his ground.) By taking a view of the land, and of the crops, he will be soon enabled to form a good judgment of the quality of the land, and kind of crop it is best suited for. If it is a light land, and the master have this view of the land, then he will be enabled to conform the land to the light hours

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hours so are no way interested in his taking it; or let him take a spade and examine the depth and nature of the mould, by digging in one or two of the furrows in each field. The greater depth of mould there is, the better the land, and the more capable of improvement. If the earth be a black crumbling mould, it cannot be bad. Foulness and poverty are to be got the better of, but it is very difficult and expensive to increase the depth of the upper staple of the land; that is, the earth in which the corn grows. With respect to the strength and richness of the soil, thistles among the weeds are no bad test of it. It should be the new comer's business to enquire what manure dressing has been laid upon the different fields, and what course of crops they have borne; that is, what they may have been sown with since the last fallow, which will determine his future crops accordingly. If he follows this way to work, and crops his land agreeable to the directions pointed out in this work, he will have no reason to apprehend much loss; particularly, if he has got a good honest carter, with some little experience, who can plough and sow the land well, and who will not rob his master himself of the grain when threshed, nor suffer the threshers to do it. Such a man may be easily procured in every part of the kingdom; for countrymen in general, accustomed to hard and homely fare, and unacquainted with the luxuries of life, have few temptations to dishonesty, and being void of art and cunning, if a little intended to by their master, will not readily find the way to injure him. Gentlemen, who, as I have before observed, are obliged to entrust more to their servants than farmers do, have been apt to attribute their loss in agriculture to them, which, in fact, has arisen only from their trying experiments, purfiling every fanciful scheme laid down in books of husbandry, and expending more in the beauty and neatness of their lands than is necessary. If gentlemen will to profit

by

by farming, they must content themselves with tolerably clean fields, and good saving crops; but if they study to decorate the farms, by clipped hedges, large branching trees, that impoverish the headlands, &c. belt walks, and the like, they must expect to suffer in the product. Lands will require a certain number of ploughings and harrowings, and a certain quantity of manure, and will pay well for such labour and expence; but if that certain quantity is exceeded, the money is thrown away; for the land may be made to produce as good a crop with five or six ploughings, as if ten were bestowed upon it; and as to dressing, every farmer knows, it may be over done; for rank luxuriant wheat will be lodged with the first rain or wind, and the crop then is irrecoverably injured. A certain degree, therefore, of ploughing and manuring is necessary, and will be attended with advantage; but beyond that degree, the crop will not answer the tillage.

CHAP. II.

OF THE TEAM.

ANOTHER principal matter that has misled many in their calculations of farming, is want of attention to the expences of a team. Few gentlemen, commencing farmers, begin with more than fifty or sixty acres of land,—what is called a small farm. Upon such a quantity of land, I defy any but a working farmer to be a gainer; he who works upon his farm himself, and saves the expence of a servant, and who occasionally goes with his horses to job-work, ploughs and harrows for other people, who may now and then stand in want of assistance, or employs his team on spare days in carrying coals, timber

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timber, manure, &c. for such as will hire him: for three or four horses will nearly consume the whole produce of a farm of fifty acres, unless the land be very rich indeed.

Light soils may be ploughed with two or three horses; but stiff lands will require four, and sometimes five; a sufficient quantity of land then must be occupied to find full employ for such a team, in order to pay the farmer for his toils. This team will cultivate about one hundred and twenty acres of arable land; and, as in most farms, there is some meadow, some upland grass, and some coppice, we may reckon a farm of one hundred and fifty acres of land, not too much for a team of four horses, a man, and a boy. Other servants need only be hired occasionally. We will now consider the expences of such a team. But let us first estimate the value of the necessary farming implements, that we may be able to rate their annual decline in value, as part of the expences. I shall not be very nice or exact in these estimates, as the difference of a pound or two in yearly expences is of little moment; and as very accurate calculations would unusefully swell the size of this tract; but I shall set them down from minutes I have taken, and estimates I have made from such minutes, for my own curiosity, for many years.

The price of labour, and the first cost of farming implements, will be found to vary a little in different counties, but not so much as to make the difference of the aggregate sum of any consequence. Our enquiries are not about shillings, but sums of greater moment.*

It will be necessary, then, for the cultivation of a farm of one hundred and fifty acres, to have as follows:

* The price of some of these articles has been raised since the first Edition of this Book; but this difference of price, as in all farming work, may be readily allowed for in making future estimates.

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	£	s.	d.
One waggon, value about	24	0	0
Two carts	18	0	0
Two ploughs	3	10	0
A roller	3	0	0
Two large harrows	2	0	0
Four smaller ones, of two sizes	3	0	0
A winnow	2	0	0
Two thill harnesses, and three leading ones, and four halter-bridles, about	9	10	0
Two load of, or forty, sacks	4	0	0
Eight dozen of hurdles	1	4	0

[These are supposed to be made of rods growing on the farm, the making of which will not cost more than 10s. or 12s. but, as they will not last above five or six years, allowance is made in the price for new ones.]

A corn screen, sieves, measures, and other sundry articles, for even money, about	4	16	0
	75	0	0

Four horses, about	80	0	0
	155	0	0

The annual decline of value of the implements above, upon an average, will be found to be about 10 per cent. that is	7	10	0
	12	0	0

That of the horses, about 15 per cent.	12	0	0
	155	0	0

Farrier, and shoeing of four horses	4	0	0
	6	0	0

Blacksmith's bill, about	6	0	0
	2	0	0

Wheeler's	2	0	0
	3	0	0

Collar-maker, about	3	0	0
	24	14	0

Carry over £59 4 0

	£.	s.	a.
Boy's wages, 6d. per day	59	4	0
Grease for wheels, about	7	16	0
Two acres and a half of clover, value 5l. an acre, will keep four horses seventeen weeks, if cut green, and carried into the stable to them ; that is,	9	5	0
During the time of eating green meat, one half peck of oats a-day is sufficient for each horse ; say seven quarters and a half, at 19s. per quarter	12	10	0
Seventeen loads of hay will keep them the other thirty-five weeks, at 40s. per load	7	2	6
During these thirty-five weeks, they should have one peck of oats each day per horse, at 19s. per quarter ; that is about thirty quarters and a half	34	0	0
Annual average expence, &c.	28	19	6
King's duty not reckoned.	149	17	0

* I kept four horses for six months upon one acre and a half of meadow land, cut and carried into the stable : it was very rich land, and bore cutting three times ; the dung the horses made, more than well dressed that acre, and two acres more ; and they only eat besides, two pecks of oats per day, value 1s. 3d. (in 1797) that is 8s. 9d. per week. Had this land been cut for hay, I might have had three loads, value 9l. which for six months is 7s. 6d. per week : this added to 8s. 9d. corn, makes 16s. 3d. a week for four horses, or 4s. 1 $\frac{1}{2}$ d. for one : they looked well, and did a great deal of work. By this mode of farming, a horse for half a year costs but little more than 5l. and the land not impoverished, if dressed. It left a good latter-math afterward's.

Some farmers contend, that it is not necessary to give them oats while at green meat ; but, if they are worked hard, they will require oats.

The above expences being as necessary on a farm of sixty acres, as upon one of one hundred and fifty, it evidently appears, that no profits are to be gained upon so small a farm : for, after the rent, seed, and harvest are added to the amount, there must remain a considerable loss, even supposing the land, on an average, to bring in four pounds an acre ; which, considering accidents, and the necessity of letting it lie idle for a fallow, once in five or six years, it cannot be supposed to do : but, let the same team do the work of a farm of one hundred and fifty acres (which, with management, it is capable of doing) and it will yield a considerable profit, as I shall shew after shew. If gentlemen keep coach-horses, which can occasionally spare to plough or harrow a few acres, to maintain those horses, and yield a product which they can consume in their own families ; they will certainly find their account in occupying even thirty or forty acres ; as I have fully evinced in a Pamphlet I published some years ago, called, *The Way to be Rich and Respectable* ; the Seventh Edition of which is now in print, price 3s. 6d. where it will appear, that a person may live as well, and make as good an appearance in the country, for half the money that others spend, having no such land : but those who keep horses and servants, merely on the principle of farming, must not expect to profit, unless they occupy as much land as will employ those servants and horses fully.

Some have recommended the use of oxen instead of horses, as eating no corn, and, of course, less expensive ; indeed, oxen do not decline in their value as horses do, being, after four or five years labour, generally fatten'd, and young ones broken in in their stead ; nor are they liable to so many disorders as horses : if an ox falls lame, he is only fatten'd the sooner, whereas a lame horse is of little value. Again, also, there is

some little saving in harness, and attendance, when their work is done; but, when it is considered that it will require three, if not four, oxen to supply the place of two horses, and of course that a greater quantity of hay is consumed, the object saved is not so great: especially when some farmers contrive to save the decline in value of their horses, by doing their work with colts, and selling them at five years old for coach-horses. By this method, their teams have turned out very profitable to them, the only necessary care being, not to work them too hard. To effect this end, the team should consist of mares, and a mare-horse should be kept on the farm. With gentle treatment, a mare may be kept in harness till she drops her foal, and yoked again a few days after, with her foal by her side.

I received the following particulars from a gentleman in Lancashire, who kept ox teams many years. He was of opinion that all farmers should have ox teams.

An ox may be bought at three years old, lean, for 10*l.*, and at six years old will sell for 14*l.* lame or not; and should be always sold off at six years old. A good farm horse costs 25*l.* or 30*l.*, and its decrease in value at the three years end, is considerable, independent of accidents.

The average price of the food of an ox is, 1*s.* 6*d.* a week; that of a horse, besides shoeing and farriery, 8 or 9*s.* a week.

One horse will pull as much as two oxen; but the farmer gains by the latter, and loses by the former. It is now known that oxen pull better in harness, than in yoke, and that five oxen in harness, will do as much work as eight oxen yoked.

Oxen are better at a dead pull. They pull steady, and will pull so even and continued, as to break a rope by its extension; whereas horses pull more by jerks.

Being now on the subject of the team, I will take the opportunity of recommending iron axle-trees to waggons and carts.

carts, instead of wooden ones ; the first expence indeed will be more, each iron axle-tree costing about five pounds ; whereas the price of a wooden one is not above seven shillings and six-pence : but I aver, it is the cheapest in the end, as they are not so liable to break, and will last out two or three waggons ; and add to this, the principal motive of my recommending them, a waggon with iron axles is of considerable less draught than one with wood axles. I am persuaded it is the difference of one horse in four ; that is, three horses will draw as much with iron axles, as four would with wooden ones : and the reason is evident. To make wooden axles sufficiently strong, their diameter must be twice as large as iron ones ; the friction, therefore, and of course the draught, must be proportionably greater.

C H A P. III.

OF WHEAT.

WHEAT being the farmer's staple crop, to which he looks for his chief profit, he will pick out the cleanest fields for this grain, and such as are most in heart. The land is generally fallowed and manured for a wheat season, or the grain is sowed on the breaking up of a clover lay, which has lain a year or two in that artificial grass, or after a crop of turneps fed off with sheep, the land for which has been dressed or manured the spring before.

The time for sowing this grain, is from the beginning of September to the end of November ; but the prime season, as appears from a number of experiments made by Mr. Young, is between the first week in September, and the last in October.

October. Farmers, in general, wish to get their seed into the ground by the 29th of September; they seldom think of sowing earlier; indeed if they are to break up a clover lay, or sow it in a turnep field, they cannot well get their land ready sooner; as, in the first case, they lose the clover feed in the month of September; and, in the other, the turneps are of little value much before Michaelmas. If, therefore, they have much wheat to sow, and but one team to prepare the ground, necessity often obliges them to be sowing wheat in the month of November. If the land be wet, by postponing it so long, they may chance to lose the seed-time, from an impossibility of working the ground; but if the land be dry, the end of November will not be too late to produce a tolerable crop. The nearer it is sowed to Michaelmas, the more we may expect to reap.

Next, as to the quantity of seed per acre: This is, in some measure, determined by the cleanness and richness of the land. If sown upon a fallow, or after turneps, two bushels an acre is the general allowance; if on a clover lay, rather more than two bushels—about two bushels and a half. In a variety of experiments on clayey and gravelly soils, Mr. Young asserts, that two bushels and a half is the most advantageous quantity for an acre of land; but farmers in general seldom sow more than two bushels, or two bushels and one peck.

To prevent the wheat being black or smutty, it is seldom sown without being first steeped some hours in brine, made of water in which as much salt has been dissolved as will cause an egg to swim; when taken out, it is dried with powdered lime, and then sown. This custom took its rise from an accident near the sea side, where a quantity of wheat was sown, that, by the wreck of a vessel had been some time under water. It was observed, that the year, in which this happened, was remarkable for smutty corn, and the wheat in that neighbour-

bourhood particularly so, whilst the produce of that grain that had been soaked in salt water was totally free from the least appearance of smut. Many farmers lime the seed only, by pouring boiling water on lime, and, when cold, soaking the seed in it.

The seed once sown, it requires little care till harvest: all that is necessary is, to keep it dry by water-surfacing, to weed it in the spring, if foul (which should be done, if possible, before the end of April, lest it should be too much grown), and if its colour be a very dark green, and the crop should be too luxuriant, owing to the strength and richness of the land, to turn a flock of sheep into it, in dry or frosty weather, in the month of March, and let them eat it down close to the ground. If this precaution be not taken, there will be danger of its falling, or being lodged, by wind or rain, before harvest, and the crop in a great measure spoiled. When eaten down by sheep, it will branch out afresh, and the stems, will be shorter, and less liable to fall.

Should the wheat, in March or April, bear a yellow hue, it is a sign of its not being healthy; its colour should be a dark green. In wet land it will look yellow; but, as the dry weather approaches, it will regain its colour. In wet soils, the narrower and higher the ridges or lands lie, the better; what ploughmen call, two or three-boun lands, are best; in this case, there being a greater quantity of furrows, the water will, of course, run off the readier, and the lands lie drier. In harrowing such lands, after the corn is sown, the horses should go in the furrows; this will leave the ridges round and smooth. In sowing wheat, some plough it in, and others only harrow it in like other grain; the chief advantage of the first way is, to preserve it from the birds. Wheat may be sown, with advantage, with, or after, the second ploughing.

If, in the month of February or March, the crop appears thin,

PRACTICAL HUSBANDRY.

thin, weak, or unhealthy, top-dressings of wood-ashes, malt-dust, or soot, may be occasionally sown over it, at the rate of about thirty or forty bushels an acre, which will greatly improve it; but this is an additional expence of twenty shillings an acre, neither of these articles being the produce of the farm.

Change of seed is another material object of attention, to which farmers pay a due regard, that their wheat may be large and heavy; nay, some kinds of grain will produce a greater quantity than others. The chief point with farmers in general is, not to have seed, if they can help it, from their own neighbourhood, but, to procure seed from light land to sow on a stiff soil; and seed from stiff or strong ground, to sow on light soils; and great care should be taken, that the seed sown be clean from the seeds of weeds, otherwise you contribute to the foulness of your land.

In a word, though wheat is a grain that will not pay great expences in the culture, it should either be sown on land in good heart, or not at all. It is a crop that should ever succeed meliorating ones, viz. beans, clover, tares, turnips, &c. or a summer fallow, and thrives best on stiff ground.

The following is an estimate of a generally saving crop upon an acre of ground. As I suppose the farm to consist of one hundred and fifty acres of land, and the aggregate expences of a team, wear and tear of implements, &c. to be as before stated 149l. 17s. I shall rate the team at twenty shillings an acre. The account then will stand thus:

EXPENCES.

	£.	s.	d.
Rent, tythe, and taxes, suppose	1	0	0
Team, &c.	1	0	0
Two bushels of seed, at five shillings	2	10	0
Additional labour in carting, and spreading manure, and water-furrowing	0	2	6
			6
B 2			6
Carry over £.2 12			6

	Brought over	£.	s.	d.
Brining	2 12 6			
Weeding (this not always wanted)	0 0 6			
Renting (this sometimes less or more)	0 1 6			
Additional labour in carrying in	0 8 0			
Threshing two quarters and a half and cleaning, at 3s.	0 7 6			
Binding one load and a half of straw	0 1 6			
	—————			
		£.	3 12 6	

Note. In some articles more is paid now for labour and barbaging, than when these estimates were made; this must be allowed for, and also the difference in the price of grain.

PRODUCE.

	£.	s.	d.
Two quarters and a half of wheat, at forty shillings	5	0	0
One load and a half of straw, at twenty shillings	1	10	0
	—————		
Expences	6	10	0
	—————		
Nest profit	3	12	6
	—————		
	£.	2 17 6	

Land may be brought into such heart, as to produce four or five quarters of wheat an acre; at least such land as that I am now speaking of, which I suppose to be worth fourteen or fifteen shillings an acre. In this case, every additional bushel of grain will produce an additional profit of eighteen shillings and six-pence. In the above estimate, I have also rated the price of wheat very low; it is much oftener at a higher price than otherwise.

Wheat will receive a greater advantage from dressing, if the manure be not laid on immediately for it; that is, if the winter crop follows an improving crop of turnips, beans, &c., for which the land had been previously dressed; for, by this method,

method, the great strength of the manure, which makes the wheat rank, is taken off by a prior crop.

Besides, dressing and fallowing land for tares or turnips will produce a luxuriant crop, that will overshadow the land so much as to smother any weeds carried on by the dressing, and of course the succeeding wheat-crop will be cleaner, as I shall shew in the chapter on Tares.

In looking over a field of wheat, if it be free from smutty ears, the straw pretty thick on the ground, and not lodged, the ears in general large, and the crop tolerably even; that is, the ears of corn throughout the field rising every where from the ground to a level with each other, it may be pronounced a good crop.

Wheat is ripe and fit to reap, when the straw is every where yellow, and the ears hang down. If the wheat sheds in reaping, it should not be cut in the middle of the day, but mornings and evenings, when the dew is on; and that part of the field should be first cut that was first sown.

There are two or three sorts of wheat, but I do not know that one will produce a more profitable crop than another.

If, after wheat is reaped and bound, there should be much wet, the grain will be apt to shoot, particularly in the bands. In this case, it should be opened, dried, and re-bound.

Between three and four hundred sheaves an acre, provided the ears be large and heavy, is a very good crop. Some acres will yield from seven to eight hundred sheaves; where there is so much straw, there is generally less corn. Some acres again, if the land be poor, will produce scarce two hundred sheaves.

If fifteen sheaves produce a bushel of wheat, it is a very good crop. In this case, an acre that gives three hundred sheaves, will yield two quarters and a half, or half a load of wheat.

CHAP. IV.

OF BARLEY.

BARLEY thrives best on a dry light soil, and requires three ploughings at least, if not four, with a good deal of harrowing to bring the land into fine and proper tilth. The stiffer the soil, the more ploughings are necessary. If the spring be fine and dry, there is time to make the ground tolerably clean for this crop, which is seldom sowed till about the beginning or middle of April. Barley is frequently sowed, and with success, in the last week in April; but Mr. Young, from a variety of experiments which he made, assures us, that, provided the land be dry, and can be got into good tilth early enough (which may be, if barley follows a summer fallow), the most profitable time of sowing it, is the end of February, or the beginning of March, as such early sowing will produce a third more at harvest. This may be true, and worth the trial; but farmers, in general sow it late, that they may have an opportunity of bestowing much labour on their land, and making the soil as fine as possible. Besides, such late sowing often enables them to crop the land that was sown with turnips the year before for sheep-feed, and which cannot be eaten off, perhaps before the end of March.

The quantity of seed usually sown, is four bushels per acre; and this is universally allowed, when clover is sown with it, to produce the best crop at harvest. Indeed, when barley is sown without clover, five bushels of seeds will produce more grain at harvest than four, but not in the proportion of five to four; so that four bushels of seed per acre, is certainly the proper quantity to sow with or without clover. As, in the case of wheat; the richer the land is, the less quantity of seed is requisite;

requisite; but that diminution of quantity is not great, perhaps a peck, or half a bushel.

Change of seed is here as necessary as in wheat crops. Care should be taken to sow such as was raised on a different soil to that on which we mean to sow it; and that the seed be clean from the seeds of weeds.

The general method of cultivating barley is, to sow the land with clover after the barley is in the ground, as will be shewn when we speak of clover; at present I will give the reader an estimate of a tolerable saving crop of an acre of barley alone, but of such with which clover is mixed.

EXPENCES.

	£.	s.	d.
Rent, tythe, and taxes	1	0	0
Team, &c.	1	0	0
Four bushels of seed, at three shillings and sixpence	0	14	0
Mowing	0	2	6
Expences of getting in	0	4	6
Threshing five quarters, at two shillings	0	10	0
	<hr/>		
	£	3	11
		0	

PRODUCE.

	£.	s.	d.
Four quarters, at twenty-eight shillings	5	12	0
Straw, one load and a half, at twenty shillings	1	10	0
	<hr/>		
Expences	7	2	0
	<hr/>		
Net profit	£	3	11
		0	

Seven quarters of barley is no uncommon crop for rich light land; but from stiff land, you may not reap more than four, or three. When this is the case, barley should not be sown. I have valued the straw at the price it would sell for;

but this should be eaten by the cattle, and consumed on the farm, for the sake of the manure. But, admitting this to be done, it is still of equal value to the farmer.

From a continuance of dry weather after the seed is up, the blade will sometimes look sickly, and wear a yellow hue; but a little rain will soon recover it.

The same indications that declare wheat to be ripe, will pronounce barley to be fit to cut.

Care should be taken that barley with which clover was sown, should be turned after it is cut, sufficiently to dry the clover, before it is either housed or stacked; otherwise it will heat in the mow, and spoil the grain. Good barley, as good wheat, may be known by the grain's being heavy, large, fair plump, and sweet-smelling; not dry, discoloured, small, shrivelled, or musty.

C H A P. V.

OF OATS.

THIS grain, though not so profitable as wheat or barley, from the great number of horses kept in this country, is a part of every farmer's crop. Indeed, though the produce is not of equal value with a crop of barley or wheat, there is more certainty in the price it will fetch at market; for I never yet observed so great a variation in the value of oats, as in that of the other two. If a farmer finds his land rich, and able to bear crops for years together, that will turn out more profitable than oats, he would be imprudent to grow any. In this case, it will be his interest to buy all the oats he wants, rather than grow them to a disadvantage; but, if his soil be a hungry one,

and

and he cannot procure sufficient manure, he will do right to have a crop of oats occasionally; for oats will grow almost in any land; though here, as in other crops, the richer the earth, the greater will be the produce. From four to five quarters of oats on an acre of ground, is a very good crop, where the land has been even dressed; but, as farmers are apt to take three or four crops from their ground, after it has been fallowed and manured, before they sow it with oats, they seldom get more than three or four quarters an acre; whereas, were they to sow the seed on ground in good heart, the produce of an acre would be from seven to ten quarters.

There are several kinds of oats, such as are known by the names of, Essex, Poland, Scotch, and Black. The first two are a large-bodied grain; the Scotch, are small white oats, such as are given to horses; and the black are also good horse-corn but of a black colour. The Essex and Poland thrive best in light barley-land, the Scotch and black on strong wheat land. The fairer, plumper, and shorter the body of the grain is, the better the quality; and to make it marketable, it should not be brown or mow-burnt, or have any musty smell. Such as is designed for seed, should be well cleaned from the seeds of any weeds.

Clover may be, and often is, sown with a crop of oats; but this is chiefly on stiff land, where barley is never sown. In light barley land, farmers prefer the barley crop to sow their clover in, because, at that time, the ground is cleaner, and in better heart. I shall treat of an oat-crop here as sown by itself, without any mixture of clover, or other grass.

Farmers seldom plough more than once for oats; though it would be better to turn the last year's stubble in before Christmas; and the customary time of sowing them is in the month of March, but a dry April is a better seed-time than a wet March. As oats thrive best generally in stiff ground, it is

proper

proper to roll them after they are up. Black oats will, generally speaking, admit of being earlier sowed than white ones.

The quantity of seed generally allowed for an acre of ground, is five bushels; though Mr. Young (whose authority I have more than once quoted), from his experiments, asserts, that the most advantageous quantity is, from seven bushels to seven bushels and a half; but it appears from his enquiries, that the produce of six bushels does not exceed that of four bushels and a half, more than about one bushel and a half, which is just the extra quantity of seed; so that his experiments prove no more than that five bushels, the customary allotment of all farmers, is the most advantageous.

The following is an estimate of a tolerable crop on an acre of ground :

EXPENCES.

	£.	s.	d.
Rent, tythe, and taxes	1	0	0
Team, &c.	1	0	0
Seed, five bushels, at two shillings and six-pence	0	12	6
Mowing	0	1	6
Weeding and water-furrowing, perhaps	0	2	0
Getting in	0	2	0
Threshing four quarters, at one shilling and two-pence	0	4	8

£. 3 2 8

PRODUCE.

	£.	s.	d.
Four quarters, at twenty shillings	4	0	0
One load and a half of straw, at twenty shillings	1	10	0

Expences	£.	s.	d.
	3	2	8

Profit	£.	s.	d.
	2	7	4

There is an additional expence in carrying the crop of every

field

field to market, which I have not mentioned before, nor was it perhaps necessary now, it being in itself but trifling.

Plenty of straw in a crop of oats, generally denotes plenty of grain; but it is not always so in other crops.

There is a critical time in cutting of oats; if they are cut too soon, before they are ripe, great part of the grain will not be threshed out; if they stand till they are full ripe, they are very apt to shed in cutting, turning, and getting in. He who would preserve his good crop, should, as they ripen, every day examine it; and, if he finds them easily rub out as he handles them, should order them to be instantly cut. It sometimes happens, that one part of a field shall be riper than another; when this is the case, the riper parts should be cut in the mornings and evenings, when the dew is on them; the greener part, not so liable to shed, may be cut in the middle of the day. The same care should be taken in turning them, and raking them together after they are cut. If they are stacked, or housed before the straw is quite dry, they will be apt to heat in the mow, get a brown hue, and a musty smell, which will considerably reduce their value; and if they are full ripe, when cut and tumbled about in the middle of the day, half the crop will be left shed and scattered in the field.

Should the straw of a crop of oats be so luxuriant as to fall or lodge, it will receive less damage than a crop of any other grain. We need not be apprehensive, therefore, of its being too rank.

CHAP. VI.

OF BUCK-WHEAT.

BUCK-WHEAT, or French wheat, is a spring-crop, and frequently, like tares and turneps, sown merely as a man-

nure,
man-

nure, to plow into the ground, in order to prepare it for wheat. It is a grain not commonly brought to market, yet, nevertheless, of importance to the farmer, as it will thrive in lands not in proper condition for barley, and will pay him well for sowing it in rich soils; though the general opinion is, that it flourishes best on poor lands. But what is most worthy of consideration in this crop is, that it need not be sown till the middle of May, a circumstance very advantageous to such as occupy wet lands. So that if the ground be not in very good heart, or it should turn out a bad season for barley sowing, it is not an unpleasant thing to be able to reap from it a good crop of buck-wheat. Where barley is given to cattle, buck-wheat will answer the end as well; and the straw, if properly got in, will turn out good winter fodder. Wet summers, are not so favourable for it as dry ones.

The time to sow this grain is, as I said before, about the middle of May, and the most advantageous quantity of seed, per acre, one bushel. If the land, by frequent ploughings and harrowings, be made tolerably fine, and the season be favourable, there is little doubt of having a good crop.

An estimate of an acre.

EXPENCES.

		£.	s.	d.
Rent, &c.	-	-	-	1 0 0
Team, &c.	-	-	-	1 0 0
Seed, one bushel	-	-	-	0 3 6
Mowing	-	-	-	0 1 9
Harvesting, &c.	-	-	-	0 3 0
Threshing four quarters, at one shilling and two-pence	0	4	8	
		£.	2	12
			11	

PRODUCE.

	£.	s.	d.
Four quarters, at twenty-eight shillings	5	12	0
Expences	2	12	11
Profit	2	19	1

When the land is in good heart, it is no uncommon thing to reap eight or nine quarters from an acre; and at market it will generally fetch the price of middling barley.

CHAP. VII.

OF BEANS.

BEANS thrive best in a strong, stiff soil; and few farmers sow them but in such ground. There are several sorts of beans, though seldom more than two are the objects of the husbandman's attention; these are horse-beans for the feed of horses, and tick-beans for the food of hogs. I have seen some fields of long-pods, which is a garden bean; and I have myself sowed an acre or two, more than once, with broad Wind-sors, and dwarf kidney beans; but as these are out of the line of farming, I shall not say more about them.

Of the two sorts usually cultivated at large, horse-beans require a stronger ground than tick-beans. There are two methods of sowing them; some sow them broadcast on the ground, and plough them in, in one earth flat; or plough the ground first into ridges, then sow them broadcast, and harrow them in; and others set them, bean by bean, in a line with dibbers. I have tried them both ways, and scarce know which to give the preference to. If they are sown upon a clover lay, they certainly should be set, that is, pricked in bean by bean; for as seldom more than one ploughing is given to a crop of beans, the earth of a clover field, when broke up, is not fine enough, that is, not sufficiently pulverized, to admit of their being sown broadcast, like other grain; but, if they follow a crop of turneps, wheat, or oats, broadcast sowing will do very well.

In

In sowing beans broadcast, the expence of setting them (which is done by women and children) is avoided; and also a further disadvantage; for though the distance from row to row is pointed out to them, they are apt to set them too thick in the rows, being paid in proportion to the quantity they set, seven-pence or eight-pence a peck, which they get rid of as fast as they can; nor, watch them and talk to them as you will, can you prevent their doing it: this not only wastes the seed, but too often injures the crop. But then again, on the other hand, when sowed broadcast, every part of the field may not be equally covered, the land does not look so neat, and there being a greater difficulty in hoeing them, the men are usually paid six-pence or nine-pence an acre extraordinary. The quantity of beans sown and set is nearly the same in both ways. About two bushels and a peck, or two bushels and a half per acre. The crop at harvest is rather in favour of setting than otherwise, but perhaps not sufficient to pay the extra expence.

If drilling of crops be worth the attention of the farmer, it is more so in beans and peas than in any other grain; but even here, setting them is a very good substitute; and considering the expence of a drill-plough, which not one wheeler in twenty knows how to make or repair, and not one ploughman in a hundred knows how to use, I question whether setting is not equally cheap in the end. I am sure it is less troublesome to the farmer. Besides, on stiff clayey soils, where beans best thrive, it is impossible to use a drill-plough, which is adapted only to loose, light lands.

The end of February, or early in March, is the customary seed-time for beans, though many sow them so late as April; and some, I have heard say, put them in at, or before, Christmas. From Mr. Young's Experiments it appears, that early in February is the most advantageous time; but accidents will occasionally delay the sowing, sometimes for a week or a fortnight.

night, such as wet weather, particularly where they are set by women, and there is a want of hands to set them.

The great advantage of a crop of beans to the land arises from the hoeing, as such a crop must be always hand-hoed with a six-inch hoe, once, if not twice, during its growth. If the land be tolerably clean, and the hoeing can be deferred till the beginning of May, once may be sufficient: but if, after the first hoeing, the weeds still get a head, and are likely to rise as high as the beans, they must be hoed a second time. If the land be in good heart, and the beans grow away strong, after once hoeing, they will get above the weeds, and by their luxuriance keep them down, and smother them. As beans have a tap root, and draw their nutriment chiefly from the lower staple of the ground; and as they are hoed once or twice during their growth, and of course the weeds destroyed; farmers consider a bean crop almost as good as a summer-fallow, and will often sow wheat immediately following; though I do not hold this to be good farming, unless the land had been manured for the beans. A master will be better able to judge whether they be clean hoed, provided they are set in rows, than in the broad-cast method of sowing; and in a broad-cast crop, it is as necessary to cut out beans with the hoe, where they rise too thick, setting them out at distances in the manner of turnips, as it is to cut up the weeds. To know whether this be properly done, we must walk over every land.

To judge whether a field of beans be good or bad, we must examine how they are kidded; for a good crop depends more on this, than on the quantity of haulm. If they are kidded all the way up from the bottom to the top, and the kids in general contain five or six beans, we may expect to reap largely; but, if otherwise, the reverse. A dry summer is not so good for beans as a showery one; for, in very dry weather, the stalks are short and slender, and the crop often blighted; that

is,

is, covered with a black fly; in this case, they must take their chance, for rain only can recover them.

They are seldom ripe enough to cut till September; but the proper time may easily be known by examining them. When the kids are black, and begin to open at the end, they ought to be cut; and though throughout the field some of the kids be not so black as others, this should not prevent us; for they will ripen and harden after they are cut, by setting the sheaves upright, and leaving them out in the field for a week or ten days. If they are cut before they are ripe, they will shrivel: and if too ripe, they will shed considerably in the cutting. Should this last be the case, they should not be cut in the middle of the day, but in the mornings and evenings only, when the dew is on them. They should not be pulled up by the roots, for you would thus carry a quantity of dirt into your threshing floor, but cut off with a hook, as they reap wheat.

An acre of land proper for beans, will produce, with good culture, from two quarters and a half (that is, half a load) to five or six quarters; but three quarters and a half, or four quarters, may be reckoned a very good crop. Rather a greater quantity of tick-beans may be got from an acre of ground than horse-beans; but horse-beans bear always a better price, so that the value of each crop will be much the same. In purchasing beans, particularly for seed, care should be taken that they are hard, and not shrivelled; and the smaller the bean, the better, as there are a greater quantity in the same measure. Beans will generally fetch a greater price after they have lain in the stack eight or nine months, than if they are threshed out before Christmas, as they are then harder and better for seed.

The following is an estimate of an acre of horse-beans, supposing them to have been set.

EXPENCES.

	L.	s.	d.
Rent, tythe, and taxes	1	0	0
Team, &c.	1	0	0
Two bushels and a half of seed, at four shillings	0	10	0
Setting, at eight-pence a peck*	0	4	0
Guarding them from the crows, and water fur- rowing	0	1	0
Hoeing twice; the first time five shillings and six- pence; the second, four shillings and six- pence	0	0	0
Cutting	0	6	0
Carrying and stacking	0	1	4
Thatching	0	2	0
Threshing three quarters and a half, at one shilling and fourpence	0	4	8
	<hr/>	<hr/>	<hr/>
	£3	19	0

PRODUCE.

	L.	s.	d.
Three quarters and a half, at thirty-two shillings	5	12	0
Expences	3	19	3
Profit	1	13	0

Where manure is laid off for any crop, it will add something to the expence; as an additional hand or two must be employed to fill the cart, and spread the dung. The price of spreading, is generally one shilling per acre, and one shilling or eighteen-pence an acre may be reckoned for labour in filling.

* If the women cover in the seed, they expect one penny a peck more; this, therefore, should be done with the barrow.

+ I have mentioned here, guarding from crows, for it will be found necessary to employ a boy for eight or ten days for this purpose, while the seed lies uncovered in the ground, before it can be barrowed; and when the beans are coming up; as crows, at these times, are apt to devour them, and thus injure the crop.

Mr. Young tells us, that, from the experiments he made, he finds, that by sowing beans upon the same lands, year after year, each succeeding year will produce a better crop than the year before, even though no dressing be put upon the land; that where the first year produced only three quarters and a half, the third year produced five quarters. This he attributes to hoeing and destroying the weeds, which was done three or four times in each year, and the tops of the beans being cut off, just as they were going to blossom. It may be worth the trial on small spots of ground, but it is a thing never done by farmers.

I hold trench-ploughing to be good in the culture of beans, where the depth of mould will admit of it, as it gives the plant room to strike deeper than in the ordinary method of ploughing, but I am no advocate for turning up the gravel or clay among the mould.

C H A P. VIII.

OF BEANS.

PEAS generally flourish most in light, dry, sound land, but tolerably good crops may be procured on cold, brick earth, loams, or clays.

There are various sorts of peas, but those usually sown by farmers, are white peas and hog peas; the first is well known, but, of hog peas, there are also two or three sorts, grey, dun, blue, &c.

There being other crops that pay better than peas, farmers generally sow them on poor land, such as is grown foul, and perhaps out of heart; but, like every other crop, I am persuaded,

farmed, they would pay for a certain degree of cultivation ; but over-dressing would make the haulm grow large and rank, and the crop will suffer by it. Wet seasons are always prejudicial to peas ; for the above reasons, peas are not always a part of the farmer's crop.

In light land, drilling them may be a good method, as, in that case, if necessary, they can be better hoed, and a future crop also will receive a benefit from such hoeing ; but in strong stiff lands, they must be sown broad-cast. Indeed, sowing broad-cast will, all things considered, produce a greater quantity at harvest, than drilling ; and, as it is attended with less trouble and expence upon the whole, perhaps it may be as well, if not better.

The quantity sown on an acre of ground of the white peas, is generally three bushels ; but Mr. Young, from his experiments, finds, that four bushels and a half of white peas, and five bushels and a half of hog peas, are a more proper quantity ; for, in wet seasons, if a quantity of seed sufficient to flock the land be not sown, a proportion of weeds will occupy their place, and where farmers do not hoe their peas, a thick crop is necessary to cover the ground, and smother the weeds.

The customary time of sowing, is about the middle of March, and that of cutting, in August. When they begin to ripen, it will be necessary to station a boy in the field to frighten away pigeons, and other birds, otherwise they will carry away half the crop. The same attention must be paid to the time and manner of cutting, as was pointed out in the case of beans. A good sample of peas, is, when they are not shrivelled, but look large, plump, and fair.

An estimate of an acre of broad-cast peas.

EXPENCES.		
Rent, tythe, and taxes	1	0
Team, &c.	1	0
Carried over	2	0

	Brought over	£. s. d.
Two bushels and a half of seed, at four shillings	0 10 0	
Weeding and water-furrowing	0 2 0	
Frightening birds	0 2 0	
Hoeing	0 1 5	
Cutting	0 3 6	
Carrying in	0 2 0	
Threshing three quarters, at one shilling and two-pence	0 3 6	
		<hr/>
		£3 8 0
		<hr/>

PRODUCE.

	£. s. d.
Three quarters, at thirty-two shillings per quarter	4 16 0
Expences	3 8 0
Profit	<hr/> 1 8 0

For the culture of peas, the land should undergo three or four ploughings, and many harrowings, to bring it into as fine a tilth as possible.

Drilled peas, like beans, should be twice hoed, which will be an additional expence of five shillings an acre, but a future crop will be benefited by it.

C H A P. IX.

OF TARES.

TARES are cultivated for three or four purposes. Some sow them for the seed; others to cut green for horses and other cattle; some make the haulm into hay, for winter feed, and other feed it off with sheep and lambs in the spring. In whichever way, however, the crop is consumed, though it

seldom

seldom forms part of a farmer's regular course of crops, it is, nevertheless, far from being an unprofitable one.

There are two sorts, winter tares, and spring tares; the first are a hardy kind, and generally sown before or about Michaelmas, to cut green for horses in the spring, or stand for seed.

If they are sowed in the month of August, and designed for seed, they will be fit to cut early in the month of August following, after which there will be sufficient time to prepare the land for wheat; or when the tares are carried off the ground, it may be ploughed up, and sown with turnips, by which means two crops are produced from the same ground in one year.

But the best farming is to sow them at Michaelmas, or not later than the second week in October; about two bushels, or rather better, to an acre, and that upon land that has been fallow and dressed: from such fallow and dressing, may be expected a very luxuriant crop, that will rise above, and smother every weed that might either be carried upon the ground in the dressing, or not be destroyed by the fallow. This crop should be cut for hay, in the beginning of June; when, after two ploughings, the land may be sown with turnips, and being eaten off by sheep at Michaelmas, the ground is in the best order that can be for a crop of wheat, as it will then be perfectly clean, and in good heart; for the dressing the sheep leave, will amply compensate for the crop of tares, which not being suffered to stand for seed, will not draw the ground, but leave it in the finest order. Thus, also, two crops will be gained in one year, without injuring the land.

Whether spring tares are sown for hay, or for seed, the quantity of seed, and time of sowing are the same. As one great advantage in cultivating this pulse, is bringing the ground into fine order for wheat or barley; it would be well if the land were dressed for it, and care taken to sow it early, that there may be a thick crop, sufficient to cover the ground and

smother the weeds. March is the proper time for sowing, and the quantity, two bushels and a half per acre. Once or twice ploughing will do for tares, which should be rolled after they are well harrowed in. They require no farther trouble till harvest, except cutting out the thistles, if any should rise, for every other weed a thick crop of tares will destroy; and such is the advantage of a thick crop, that if you cut for hay, they admirably prepare the ground for a crop of wheat, breeding that putrid fermentation in the soil, which renders it as fertile and as mellow, as after the best fallow.

If tares are destined for hay, the time of cutting them is when they are in full blossom. If they are left longer, they draw the land too much, and make not such good hay as when they are in the highest state of succulency. Though some contend, that the hay will prove heartier food, if they stand to pod, and the pods to fill; that in this case, horses eating such hay, will require less corn. This I believe to be the case, but I am a strong advocate for keeping the ground in good condition. If the crop be got in without rain, tare-hay is better than any common hay, but rain injures it a great deal.

The following are the expences and profits of an acre made into hay.

EXPENCES		
	£.	d.
Rent, tythe, and taxes	1	0 0
Team, &c.	1	0 0
Seed, two bushels and half, at four shillings and six-pence	0	11 3
Weeding, perhaps, or water-furrowing	0	1 6
Mowing	0	1 9
Making, &c.	0	3 6
		<hr/>
	£	18 0

PRODUCE.

	£.	s.	d.
Two loads and a half of hay, at thirty-five shillings	4	7	6
Expences	2	18	0
			<hr/>
Profit	1	9	6

In farms where there is not a sufficiency of grass land, a field or two of tares for hay, must be very advantageous, especially as they leave the land in better state than when they were sown. Besides, if they are not to be followed by a crop of wheat, the land may be immediately ploughed up, and sown with turneps, which will produce an additional profit of near thirty shillings an acre, as may be seen in the chapter on Turneps, and leave the soil in fine state the next year, for barley, oats, or any other spring crop.

The following estimate supposes the tares to stand for seed.

EXPENCES.

Rent, &c.	£.	s.	d.
Team, &c.	1	0	0
Seed, as before.	1	0	0
Weeding, &c.	0	11	3
Mowing	0	1	6
Getting in	0	1	6
Threshing two quarters, at two shillings and four-pence	0	4	8
			<hr/>
	£3	0	8

PRODUCE.

Two quarters of tares, at thirty-six shillings	£.	s.	d.
Expences	3	12	0
	3	0	8
Profit, besides the haulage	0	11	4

Now, on the fairest calculation, here is evidently a loss of eighteen shillings and two-pence between the two profits,

which might have been avoided, had the tares been cut for hay; besides the injury the ground receives by a seed-crop, and the loss of so much dung, as cattle eating that hay upon the farm would have yielded. An acre may possibly produce two quarters and a half, which is an additional profit of about seventeen shillings; but this is not, in my opinion, an adequate compensation for drawing and impoverishing the land.

CHAP X.

OF TURNEPS.

TURNEPS, like tares, is one of those meliorating crops, whose culture cleans the land, and, at the same time, enriches it. They thrive best in light soils, but succeed tolerably well on stiff ones. Very strong clays are the only soils in which they will not grow to advantage.

Farmers consider a crop of turneps as a summer fallow, and as the best preparative for either wheat or barley. To obtain a good field of turneps, they plough the land four or five times, harrow it till it is as fine as they can make it, and then dress it. All this is done with the same view that recommended tares, viz. to procure a luxuriant crop, that will smother the weeds which the dung carries into the field with it, in order that the succeeding crop, whether of wheat or barley, may be clean and plentiful. Besides, as this crop is fed off by sheep, the better it is, the longer will it maintain a given number of sheep, and of course the greater quantity of dressing such sheep will leave behind them. It is generally a losing crop for that year, but the advantage hereafter reaped, amply repays the loss.

The

The most proper time to sow them, is about Midsummer, or soon after, so that if the spring be fine, there is sufficient time to clean the ground. Though we wait a week or two for it, a dripping time is best for sowing, for, without some rain, the seed may not grow; in very dry seasons, as soon as they are out of the ground, the fly is apt to destroy them; and, when this is the case, we have no other resource than to harrow the land, and sow it afresh.* If they escape the fly, as soon as they put forth the rough leaf, they should be hoed with a nine-inch hoe, cutting them up where they are too thick, and leaving them about nine inches distance from each other. About a month after, they should be hoed a second time, to destroy the weeds: by this time, they will be of sufficient growth to keep the weeds down, and smother them. They require no other care till they are either drawn for cattle, or eaten off by sheep. One pound of seed per acre is the quantity usually sown: and as there are two or three sorts of turnips, some prefer the green round, and others the tap-root-ed, as growing to a larger size. In a tolerable good crop, the average weight of an acre of turnips, is about thirty or thirty-two tons. They rather improve in weight from December to January, but decline in weight from January to March. In my neighbourhood, where farmers have not a sufficient stock of sheep of their own, they sell their turnips to those who have; and the price of an acre varies in proportion

* Mr. Vagg, in 1788, obtained a very large Subscription, for communicating a method he had of saving them from the fly. He says that it is not a fly that absolutely kills the young plants, but a whitish slug, that devours them in the nights; and that the mode of destroying this insect, is by rolling the field in the night, as soon as the seed-leaf appears, with a barley roller, 18 or 20 inches in diameter; and after two or three days, rolling it a second time in the night, unless a day or two after the first rolling, the plants shall look strong and vigorous. The tread of the horses will not injure the crop. It will do more good than harm.

to the quantity of seed there is, from twenty-five shillings to forty shillings; and they never think of disposing of their crop any other way. Those who drive them, to fatten cattle, may possibly turn them to greater advantage; Mr. Young says, double; but, as every farmer has not money to buy stock to fatten, he is obliged to give up that thought, and content himself with enriching his land, by folding of sheep upon it. For ten acres of turneps would require a flock of one hundred and twenty-four pounds in cattle, to consume them.

For curiosity, let us see what is lost on an acre of turneps well-folded.

EXPENCES.

	L.	s.	d.
Rent, tythe, and taxes	1	0	0
Team, &c.	1	0	0
Filling dung-cart, and spreading, suppose	0	2	6
Seed, one pound	0	0	6
Twice hoeing; first time six shillings, second four shillings	0	10	0
	<hr/>	<hr/>	<hr/>
Supposing the acre to sell for	2	13	0
	<hr/>	<hr/>	<hr/>
The loss is	1	15	0
	<hr/>	<hr/>	<hr/>
	0	18	0

But even here is a gain of twenty-four shillings and six-pence, deducting ten shillings and six pence, the expence of the turneps, from one pound, fifteen shillings, (the price they sell for) when we consider that, without this crop, the land would have lain idle; and, when we take into the consideration the advantage the next crop or two receive, from clean enriched land, we shall have no reason to complain.

	L.	s.	d.
In fattening lean stock, a ton weight of turneps is worth about	2	2	0
In feeding lean stock, about	2	6	0
In feeding sheep on the land	1	0	0

Stall-fed cattle, besides a rack of hay, will daily eat, in winter, between a third and fourth part of their own weight in turneps.

CHAP.

CHAP. XL.

OF CLOVER.

THE introduction of clover has turned out a great treasure to the farmer, it being one of those crops that pays well for the tillage; and, at the same time, enriches and meliorates the land. Its profits are reaped three ways, being either fed, cut for hay, or suffered to stand for seed. If the farmer has sufficient stock to eat his clover green, or has money to purchase such a stock, he will reap a double advantage by so doing; for an acre of clover, fed off green, will maintain a given number of cattle, much longer than it would, if made into hay. Besides, as in this case it does not stand to flower, it draws the ground less, and the dressing left by the cattle is no inconsiderable advantage. If cattle are turned in, in the beginning of June, three acres of clover (supposing these three acres, if cut and made into hay, to produce four loads and a half, cut out of the rick) will fatten and maintain nine horses and four cows, for four weeks; which, at four shillings a horse, and two shillings and six-pence a cow, per week, amounts to nine pounds four shillings. Now, in this time, they would eat six loads of hay, worth twelve pounds; or, were these three acres cut, and made into hay, reckoning the hay at forty shillings a load, and deducting ten shillings an acre for mowing, making, thatching, slackening, and binding, it leaves a profit only of seven pounds ten shillings; and, should a purchaser require it to be carried ten miles, such carriage would be two pounds five shillings, and reduce the profit to five pounds five shillings. But, was such a first crop of clover (for I am now only

only speaking of the first cutting. I say, was such a first crop cut day by day, carried into the stable, or farm yard, and given to horses or cows there, it would turn out still more advantageous; for it would maintain twenty horses for four weeks; (I speak this from experience) which twenty horses, in the same time, would consume eleven loads of clover hay, worth twenty-two pounds. Here, indeed, the dressing is not laid upon the land; but the horses would in that month, if littered down with about seven loads of straw, yield forty loads of dung, which would dress four acres of land well; a circumstance that would amply pay for cutting and carting home, and carrying the dung out again upon the land. Besides, a team so kept upon green meat, would require very little corn; half the quantity would do; an object of such importance to the farmer.

Let us take a second view of this.

Three acres of clover, fed off by cattle on the land.

PROFIT.

	£. s. d.
Nine horses keeping for four weeks, at four shillings each	7 4 0
Four milch cows ditto, at two shillings and sixpence	2 0 0
	<hr/>
	9 4 0

or 3*l.* 1*s.* 4*d.* per acre.

The dressing these will leave, will be equal to about two loads of dung per acre, and the land not exhausted.

The same crop mowed the first time for hay.

EXPENCES.

	£. s. d.
Mowing	0 6 0
Making and slackening	0 12 0
Thatching, on an average	0 3 0
	<hr/>
Carried over	1 1 0

	L.	s.	d.
Brought over	1	1	0
Binding four loads and a half, at two shillings	0	9	0
Carrying to the purchaser	2	5	0
			<hr/>
	3	15	0

PRODUCE.

	L.	s.	d.
Four loads and a half, at forty shillings	9	0	0
Expences	3	15	0
			<hr/>
Profit	5	5	0

or 35s. per acre.

No dressing here, and the land exhausted.

The same crop cut green, and carried into the stable.

	L.	s.	d.
Twenty horses kept for four weeks, which, if fed on dry meat, would eat eleven loads of clover hay, worth forty shillings a load, is equal in value to	22	0	0
Forty loads of dung, at five shillings	5	0	0
			<hr/>
	27	0	0
Extra expences in carrying the dung on the land, and spreading it on four acres (the team is reckoned at large upon the farm)	0	8	6
			<hr/>
Profit	26	11	6

or 8l. 17s. 2d. per acre.

Here also the land is not exhausted, but exceedingly well dressed. I have reckoned nothing for labour in cutting, as the carter and boy will do it: nor have I brought straw into the account, as the farm will produce sufficient litter, that could not be sold, bean haulm, fern, &c. Nor have I here estimated the saving in the corn given to the horses, which is considerable; nor either rent or team, these being equal in every case.

While

Whilst I am upon the article of clover, and mentioning the feed of it for cows, I must not omit the danger of turning them in, while it is young and high. Cows are internally differently formed from horses; a cow has not only a stomach, but a paunch, designed by nature as a receptacle for her food. Here she deposits it for awhile, without mastication; and when she has eaten sufficient, she, at her leisure, brings it a second time into her mouth, chews it, and conveys into her stomach, where it is digested, and carried off. Clover is a very loose vegetable, full of air, particularly when young, and in showery weather; and as the paunch has not the same digestive power with the stomach, checking that fermentation that lets loose the air; if she eats heartily of young clover, and fills her paunch by drinking soon after; when fermentation takes place, and the air is let loose, she will swell prodigiously; and from such swelling, the vital system will be impeded, the circulation of the blood stopped, and the animal will die in fifteen minutes. If she has not filled herself too full, driving her and hurrying her about, will often relieve her; but should she have overloaded her paunch, and drank upon it, there is no remedy but one, which, though severe, is generally safe and effectual (having had occasion to try it, I speak from experimental knowledge); it is, that of making an incision with a penknife through the flank into the body of the paunch, and introducing the pipe of a funnel into the orifice, thus letting out that air, that otherwise would destroy the animal. By keeping the hole open, till the complaint ceases, we remove the danger; and by piercing the hide with an awl, sewing up the wound, and the application of a plaster, it will soon heal. The place to make the incision, is in the fleshy part of the left side or flank, at an equal distance from the short ribs, the spine of the back, and the hip bone; it should be pierced till the air issues out freely. Sheep are formed like cows; of course, the same

caution

caution should be taken with them. But let the bulk of the grass be first eaten down by horses, and there is no danger; or, it is said, if they are not turned in while the dew is on the grass, it may be done with safety.

Clover is a fine thriving food for hogs: where there is a pond in the field, which they can always have recourse to, I do not know any better way of disposing of the crop. But water is so necessary, that without it, it is in vain to think of it. Any part of a field may be hurdles off with gate-hurdles; and the only trouble is, taking good care that they do not break out. Some are apt to think hog-dung prejudicial; but it is an erroneous notion. Being very full of salts, where the land is richly dressed with it, the first crop may be rank, but future crops will feel its effects for years. I am of opinion, that there cannot be more profitable husbandry, than by purchasing sows forward with pig, turning them into clover, suffering them to pig there, and continue with their pigs till they are three or four months old, and then selling them for store. An acquaintance of mine told me, that having once five acres of clover, a good crop, with a pond in the field, and well-fenced in, he purchased in May ten sows of the large breed, ready to pig, which cost him thirty pounds; that he turned them into this field about the middle of the month, kept them there till the middle of September, and then sold them; that the ten sows brought him ninety-eight pigs, which he sold for fifteen shillings each, and the sows for two pounds ten shillings each; that they folded the land like a flock of sheep, and so richly manured it, that that it wanted no dressing for near twenty years. After the clover, he sowed it with wheat, which was so rank, as to fall, and turn out of no value; but the year following, he sowed it with wheat again, and had a prodigious crop.

Supposing five acres under this management.

EXPENCES.

PRACTICAL HUSBANDRY.

EXPENCES.

	£.	s.	d.
Rent, tythe, and taxes	5	0	0
Team, &c.	5	0	0
Seed	1	2	6
Ten sows	30	0	0
	<hr/>		
	41	2	6

PRODUCE.

	£.	s.	d.
Ten sows, at fifty shillings	25	0	0
Ninety-eight pigs, at fifteen shillings	73	10	0
	<hr/>		
Expences	98	10	0
	<hr/>		
	41	2	6
	<hr/>		
	57	7	6

or 11l. 9s. 6d. per acre.

The following is an estimate more to be relied on; that of an acre hurdled off and fed, from the first week in May, to the last in September.

EXPENCES.

	£.	s.	d.
Rent, &c.	1	0	0
Team, &c.	1	0	0
Seed, nine pounds, at six-pence	0	4	6
	<hr/>		
	2	4	6

PRODUCE.

	£.	s.	d.
Keeping four hogs, eight months old, at four-pence a week, twenty-eight weeks	1	17	4
Four ditto, ten months old, at six-pence	2	16	0
Two heifers kept six weeks, at one shilling each	0	12	0
Two horses kept six weeks, at three shillings each	1	16	0
	<hr/>		
Expences	7	1	4
	<hr/>		
Profit	2	4	6
besides enriching the ground.	<hr/>		
	4	16	10

Clover, in general thrives best on light barley land. It is usually sown with the second crop after a fallow, with either barley or oats, but sometimes with wheat; and the richer the land, the better the crop. After the barley or oats are sown, and harrowed in, they customarily sow the clover, sometimes by itself, particularly if it be designed for seed, and sometimes mixed with artificial grasses for hay. When sown it should be rolled. If clover is sown with a wheat crop, it should be put into the ground in the month of March, before the wheat is too high. This is done by harrowing the ground, sowing, and rolling it. The harrows will not damage the wheat. But wheat is a crop that does not afford it sufficient shelter; of course, it is bad husbandry.

All things considered, it is much more advantageous to sow clover with a first crop after a turnep season, or a fallow, than with the second, as is commonly done; for, the land being then clean, and in good heart, the crop will be considerably greater, and the clover will stand a second year very well; especially if, in such second year, ashes, or a light dressing of dung, be bestowed on it. Indeed, clover is one of those crops, which will pay for very ample manuring; but is, at the same time, liable to be injured by unfavourable weather; a dry seed time, or a wet harvest. In dry summers, though the crop be small, it will weigh heavy, and cattle will thrive on it better than when the crop is larger, it being sweeter, and fuller of nutriment.

The quantity of seed sown on an acre of ground, is generally from nine pounds to fourteen; the average quantity ten pounds. But, Mr. Young asserts, from a variety of experiments that he made, that in poor land twenty pounds, and in clean rich land, fifteen pounds an acre, is the most advantageous quantity; as in rich land the roots will spread more, and leave less room for weeds, or natural grass.

There are several sorts of clover, viz. broad clover, which bears a red flower; the white Dutch, which bears a white flower; and the trefoil, which bears a yellow one. The first is what farmers generally sow, as growing higher, and producing a larger crop. The white Dutch, and trefoil, are better for laying down lawns and meadows, as they will marr, and grow thicker at bottom; but they are not profitable to cut for hay. There is also another species of clover, called cow-grass, from its being less liable to spring cows that feed on it. This last, though sown in March, makes but little appearance till Mid-summer, and can be cut but once; but yet grows to a great height, and produces in general large crops.

The profits of a crop of clover, as I said before, are reaped three ways; by feeding it with cattle, cutting it for hay, or suffering it to stand for seed. I have already pointed out the profits arising from feeding; let us next see what it will produce when cut for hay; and in this estimate, I will suppose an equally good crop with that I considered before as fed, viz. to produce two loads and a quarter per acre, at the two cuttings; I mean two loads and a quarter out of the rick; for clover is a grass that will lose considerably in its weight by drying.

An estimate of an acre.

EXPENCES.			
		L.	s. d.
Rent, &c.	•	1	0 9
Team, &c.	•	1	0 0
Seed, ten pounds	•	0	5 0
Mowing	•	0	1 9
Making and stacking, &c.	•	0	4 0
Mowing, making, &c. the second cut	•	9	5 9
Binding two loads and a quarter	•	0	4 6
			<hr/>
		3	1 0
			<hr/>

PRODUCE.

	£.	s.	d.
Two loads and a quarter, at thirty-five shillings	3	18	9
After-feed	0	10	0
	<hr/>		
Expences	4	8	9
	3	1	0
	<hr/>		
Profit	1	7	9
	<hr/>		

A load of clover is, in some places, generally five shillings under the market price of meadow hay; in others five above the price; but should hay be dear, this crop will be more profitable.

It should not be cut till it has done flowering, and begins to decay at the bottom; nor, should it be over-dried in the making.

When designed for seed, it should be first cut for hay, and eight or ten days earlier than when the second cut is made for the same purpose. A seed-crop is a very precarious one. A wet harvest will destroy it, and, if it does not flower well, the quantity will be small. The second growth generally determines the farmer in this matter. If the herbage be large, it should not be left for seed, as it will be apt to fall before the seed is ripe, and damage the crop. When the herbage is short, and blossoms full and large, there is a good prospect of reaping a profitable harvest. In this case, it should stand till it is quite ripe. Three bushels and a half of seed from an acre, is a good return.

EXPENCES.

	£.	s.	d.
Rent, &c.	1	0	0
Team, &c.	1	0	0
Seed, ten pounds, at six-pence	0	5	0
Mowing, making, stacking, &c. the first cut for hay	0	5	9
	<hr/>		

Carried over £2 10 9

	L.	s.	d.
Brought over	2	10	9
Mowing, &c. the second time for seed	0	3	9
Threshing three bushels and a half, at five shillings per bushel	0	17	6
Binding one load and a half of hay	0	3	0
<hr/>			
	£	3	15
	<hr/>		

PRODUCE.

	L.	s.	d.
One load and a half of hay, at thirty-five shillings	2	12	6
Three bushels and a half of seed, each bushel con- -taining sixty-five pounds, at six-pence per pound	5	13	9
<hr/>			
Expences	8	6	3
<hr/>			
Profit	3	15	0
<hr/>			

I have rated it here at six-pence per pound: it sometimes sells for more; but, often so low as three-pence.

A bushel of seed generally weighs from sixty to seventy pounds, according to the size of the grain. The smaller the seed, if good, the better, and the heavier the bushel weighs.

When a crop has stood for seed, it will produce but a small crop of clover the next year; it should, therefore, be ploughed up, and sown with wheat. Farmers, in general, say the ground is in as good heart for wheat after it has stood for seed, as if it was cut for hay; but I am of a different opinion. When threshed, the chaff and haulm (if it may be called so) will serve to fodder cattle in the winter.

C H A P. XII.

OF THE COURSE OF CROPS.

THE succession of crops is a principal matter to be attended to. Different plants draw different nourishment, and from

from different parts of the land. Those with horizontal roots from one part, those with tap-roots from another. Some require cleaner ground than others, and some, land in better heart. Again, some soils are better adapted to certain crops than others. All this obliges the farmer to study a little the nature of his land, and the method of cropping it. and experience has taught him, that it is most profitable, after the ground has been well fallowed and cleaned, to pursue the following method of cropping.

On strong stiff lands, either

1. Wheat.	5. Clover.
2. Oats and Clover.	6. Beans or Wheat.
3. Clover.	7. Turneps, or a <i>fallow</i> .
4. Beans or Wheat,	or,
5. Turneps, or a <i>fallow</i> .	1. Beans.
or,	2. Oats and Clover.
1. Tares.	3. Clover.
2. Wheat.	4. Wheat.
3. Oats and Clover.	5. Peas.
4. Clover.	6. Turneps, or a <i>fallow</i> .

Where the land is naturally rich, or made so by ample and frequent dressings, a summer fallow may not be necessary, which is designed only to rest the ground, and destroy the weeds. Dung naturally fills the land with weeds; but a crop of turneps or tares will smother them, and render it clean again: for this reason, I recommend dressing the land for turneps, or tares, in preference to wheat.

Mr. Young tells us, that he has tried beans upon the same ground for three or four years successively, and had, every future year, a better and a better crop. This he attributes to hoeing the land two or three times in the course of the summer. There is no reason to doubt his veracity, but it is not the common practice of farmers; indeed, where the soil is na-

PRACTICAL HUSBANDRY.

naturally rich, where it has been dressed for wheat, and the crop has been lodged from its luxuriancy, farmers have sown the same land with wheat again the next year, and found their account in it; for, if land be too rich for wheat, it is apt to lodge with wind or heavy rains, and be considerably damaged.

On light soils, the course of crops is varied, such as follows:

1. A fallow.
2. Wheat.
3. Barley and Clover.
4. Clover.
5. Oats, Rye, or Peas.
6. A fallow again, or Turneps.

1. A fallow.
2. Barley and Clover.
3. Clover.
4. Wheat.
5. Oats or Rye.
6. Peas.
7. A fallow.

If the land be naturally poor, the more it is rested the better; of course, the longer it lies under clover, the larger will be the crop that follows it. Indeed, as poor land is generally low rented, laying it down in pasture is the most profitable way of farming it; especially if dressing cannot be readily procured. By feeding, land is annually manured and enriched; and, at the same time, pays no great tythes; a circumstance very pleasing to the occupier, where tythes are paid in kind. Instead of a fallow once in six or seven years, it will be found frequently necessary to let poor land lie a year uncropped, once in three or four years; for if (in the farmer's phrase) it be over-driven, without a much greater quantity of manure than he generally has to bestow upon it, it will often produce little more than the seed, be the ground ever so clean.

C H A P. XIII.

ON THE PROFITS OF A FARM IN GENERAL, AND
GRASS LAND IN PARTICULAR.

LET us now recapitulate the profits on the different crops I have mentioned; and it will shew the fair advantage a gentle-

man may expect to reap from a farm of one hundred and fifty acres of arable land, under good management. As we shall take a view of seven successive years, in the course of which a round of crops takes place, it is immaterial whether we suppose the whole farm cropped the same year with the same kind of corn, or with different sorts; the produce at the seven years end will be the same.

We will begin with stiff land, on which the course of crops will be, after a fallow, 1. Tares. 2. Wheat. 3. Oats and Clover. 4. Clover. 5. Clover. 6. Beans. 7. Turneps.

	£. <small>W.</small> <small>ds.</small>	£. <small>s.</small> <small>d.</small>
1. The profit of 150 acres of Tares, cut for Hay	1 9 6	123 5 0
2. Ditto of 150 acres of Wheat, at	2 17 6	431 5 0
3. Ditto, ditto Oats, at	2 7 4	355 0 0
4. Ditto, Clover cut for Hay, at	5 5 0	787 10 0
5. Ditto, Clover fed,	5 5 0	787 10 0
6. Ditto, Beans, at	1 13 0	247 10 0
		2830 0 0

7. Loss on 150 acres of Turneps fed off by sheep, at 18s.

Profit

The waste corn at the barn door will yield in poultry 10l. a year; which, in seven years, will give a profit of

Total profit £. 2765 0 0

Divide then 2765 l. by 7 years, and it will appear, that a farm of 150 acres will yield an annual profit of 395 l. but, if the land be naturally poor, and it be necessary to make the seventh year a fallow; instead of 135 l. loss on the turneps, we must reckon the loss of rent and team, which will be 300l.

¹ In the Chapter on Clover, I have painted out, that such a crop may be made to produce a larger profit than five guineas an acre, but I have taken it here at a medium value.

this will make a difference of loss to the amount of 165 l. and reduce the 2765 l. to 2700 l. which, divided by 7, leaves the annual profit only 385 l. 14 s.

Now, supposing the farm to consist of light land, we must crop it as follows, after a fallow. 1. Tares. 2. Wheat, 3. Barley and Clover. 4. Clover. 5. Peas. 6. A fallow.

Then

1. The profit of 150 acres of						
Tares cut for hay, at	1	9	6	will be	221	5
2. Ditto, of 150 acres of						
Wheat, at	—	2	17	6	431	5
3. Ditto, ditto, Barley, at	3	11	0	—	532	0
4. Ditto, ditto, Clover, at	5	5	0	—	787	10
5. Ditto, ditto, Peas, at	8	8	0	—	210	0
Profit on poultry for six						
years, at 10l. a year				—	60	0
6. Loss on a fallow				—	2242	0
				—	300	0
				Net profit	£. 1942	0
				—	0	0

1942 l. divided by six years, gives an annual profit of 323 l. 13 s. 6 d.

As most farms consist of some meadow, take the following estimate of an acre,

EXPENCES.

Rent, &c. as before	1	0	0
Team, &c. as before	1	0	0
Mowing	0	2	6
Making and stacking	0	5	0
Thatching	0	1	0
Binding one load and a half of hay	0	3	0
	2	11	6

PRODUCE.

	l.	s.	d.
One load and a half of hay, at forty-five shillings	3	7	6
Latter-math	0	15	0
	—	—	—
Expences	4	2	6
	2	11	6
	—	—	—
Profit	1	11	0
	—	—	—

The stubbles, &c. of a farm of one hundred and fifty acres, will keep thirty sheep all the year round, of course an additional profit arises of more than 40 l. a year.

In short, a tolerable good farm, whether it consists of a light or a stiff soil, will pay upon an average, with good management, forty or fifty shillings an acre; provided the occupier holds sufficient land to employ his team fully.

The nearer a farm is to a market, and to the convenience of getting manure cheap, the more valuable it is.

Let me recommend it to every occupier of land, whether gentleman or farmer, to keep a regular account, debtor and creditor, not only of his farm in general, but of every field in particular, with a memorandum annexed of the time the seed was sown, the harvest reaped, the favourableness or unfavourableness of the season, the quantity of ploughings the land received, the dressing given it, and every other particular. By a recourse to this, at future times, he will be able to ascertain the condition of his land, and how far he proceeded upon a good plan, or fell upon a wrong one; and, of course, whether he should pursue the same method in future or not. By so doing, his business will become an amusement, and his farm not only be profitable, but instructive.

The following is a ruled page for that purpose, and a copy of such an account kept.

The

The Field called the Three Acres. 1798. Wheat.

REMARKS.

This Field, being very foul, and out of heart, was fallowed and dressed; eight loads to an acre: it received five ploughings, and was well harrowed, and the rubbish carted off.

Sown the first week in Sep-

tember; reaped the second week in August.

Dry seed-time, but rather a wet harvest; not housed till the first week in September. Rather blighted under the west hedge.

N. B. The chaff eaten by the team.

Produced three quarters per acre.

EXPENSES.

PRODUCE.

	£.	s.	d.		£.	s.	d.
Rent, tythe, and taxes, two years.	6	0	0	Nine quarters of wheat sold at forty shillings a load.	18	0	0
Team, two years	6	0	0	Four loads and a half of straw, at twenty shillings per load.	4	10	0
Six bushels of seed, at five shillings	1	10	0		22	10	0
Labour in carting and spreading manure, &c.	0	7	6		15	18	0
Brining	0	1	6	Expences	—	—	—
Reaping	1	4	0	Profit	—	5	14
Additional labour in carrying	0	3	0		12	0	0
Threshing nine quarters, at three shillings, cleaning included	1	7	0	or 12s. 6d. per acre.			
Binding four loads and a half of straw	0	4	6				
Expences in selling	0	1	6				
	£. 16	19	0				

CHAP. XIV.

ON POTATOES.

POTATOES now being a common crop with most farmers, it may not be unacceptable to the purchasers of this volume, to have this mode of husbandry pointed out.

Potatoes will grow almost any where, but generally thrive best on a light sandy loam, not too dry or too moist; it should be ploughed two or three times, and the deeper the better. To have a good crop, it will be necessary that the ground should be in good heart. Just before the last ploughing, a good quantity of mellow dung should be spread and ploughed in, at the rate of about ten loads an acre, or more. This should be done, if the weather is mild, at the beginning of March, if likely to be frosty, it may be deferred a fortnight longer. And the most advantageous way of propagating them, is by planting them at great distances, and digging or horse-hoeing the ground several times between them. Mr. Tull gives an example of it; in which the horse-hoeing succeeded much better than dung, and without the expence of it. He says, a piece of ground was planted with potatoes, the greater part of it in the common way, but in one part worse than the rest; they had been set at a yard distance every way; the rest of the ground was dunged; this poor part had no dung, but was ploughed deep at several times four different ways, so that the ground was stirred and broken thoroughly every where about the potatoes; and in this piece the crop was considerably better than where it was dressed; the plants, indeed, appeared weaker, but the roots were very large; whereas, in the dressed part, where the ground had not been stirred, they were scarce worth taking up.

In the last ploughing in March, the ground should be laid even, and then the furrows should be drawn at three feet distance from each other, and about seven or eight inches deep in the bottom of this furrow, the roots should be laid at about 18 inches asunder, and the furrow then covered in with the earth.

About the time when the shoots are expected to appear above ground, the land should be well harrowed over both ways, in order to break the clods, render the surface smooth, and destroy the young weeds. The hoe-plough (which is a small plough with one horse) may be used to stir the ground, and destroy the weeds between the rows. If this latter process is done two or three times in the summer, and the hand-hoe used between the plants, till they come to run and overshadow the land, the crop will be the better; for nothing is so beneficial to them, as keeping the ground light about them and clean.

The haulm is generally killed by the first frost in autumn; the roots should then be taken up and laid by in a good quantity of sand, or dry earth, under shelter, so as to be kept from wet and frost.

The following is an estimate of a fair crop on one acre of ground:

Rent by the year, and taxes, suppose	£ 1 0 0
Team	1 0 0
Additional labour in carting and spreading the manure	0 3 0
Nine bushels of potatoes, at 1s. per bushel	0 9 0
Cutting sinto at 1s. per bushel	0 1 1
Planting at 3d. per bushel	0 2 3
Horse-hoeing 3 times, at 1s. 6d.	0 7 6
Hand-hoeing twice, at 2s. 6d.	0 5 0
Digging up, at 1s. per bushel, 400 bushels	2 10 0
Carting away, &c.	1 5 0
400 bushels at 1s. per bushel	£ 20
Expences as above, say	7
Profit	£ 13

The land now being in a good state, is likely to produce a good crop of wheat, oats or barley, for potatoes is an ameliorating crop. At 9d. per bushel, it would pay a farmer well, the produce then would be 8l. and as a bushel weighs 56 lb. or better, given to pigs, cows, or horses, it will pay 9d. a bushel; but a good crop of potatoes will often yield 500 bushels. The haulm is not here reckoned into the profit; this, if laid down in the yard, will pay for the carting home. In the Appendix the reader will see some observations on this husbandry.

Captain Campbell, of the Warren House, Cobham, gave me the following relation. Having purchased a small farm, of which two acres, the soil light, had been an old lay, undressed for 18 years, and quite worn out, and having no dressing to spare, he had it dug up with spades, and planted it with potatoes on the surface, turning the land over them, first laying on the seed potatoes a little fern, to keep the earth loose on them. The width of each bed of potatoes was 4 feet, and an interval of 4 feet between bed and bed; the plants were set in rows 9 inches apart in the beds. This digging cost him 40s. an acre: he employed men to earth them up all the summer, during their growth, and at Michaelmas dug them up. The produce of the two acres was 1200 bushels, for which he was offered 1s. 6d. a bushel, but did not sell them, keeping them for his cattle: he said the expence of seed, planting, digging, and taking up was 8l. an acre; and had he sold the 600 bushels each acre produced, at 1s. 6d. per bushel, the produce would have been 45l. and deducting 8l. expences, the profit 37l. which doubled the fee-simple of the land: this great crop was attributed to the land having lain so long idle.

as subjects of yield. It can soon be gathered when best and easiest for gathering. **CHAP. XV.** *How to have good grass turned into hay, so as to be fit to carry to market in due time.*

ON HAYMAKING.

ALL grass is ripe and fit to cut, when in full bloom. The best method of converting it into hay, is to have proper persons who can be trusted, one to follow each two mowers, if the swarth is not more than one can spread; and let these persons scatter the swarth well all over the ground, as soon as cut; not barely turn it over, but scatter it well. In this state it should remain the whole day.

The next day, as soon as the dew is off, it should be turned again and again; and, before night, made up into grass cocks, with the trenches and drains clean raked out.

The third day, if the weather permits, it should be tedded and raked nearer together; for as it withers, it occupies less space. It should then be turned over and over in the day, and rowed in, that is, raked into rows long before evening, made into moderate large and round cocks, and the ground raked round them.

The fourth day, these cocks are again spread, turned, and if not dry enough, put into still larger cocks, and the following day opened, turned, and carried to the stack.

When hay is sufficiently made, it will rattle, that is to say, its crispness will be heard in putting it together. If the crop is thin and the weather hot, it will be fit to carry the third day, and all the process will be shorter.

By this mode of hay-making, as the mowers keep on cutting, all parts are going forward at the same time, and fewer mowers are required in proportion to hay-makers. The persons employed should be proportioned to the quantity of ground.

A good

A good mower will cut an acre of grass in a day, if it is not much lodged, two mowers two acres; so that one haymaker is sufficient for two acres the first day, the second day two acres will require two persons, the third day it may require two, but one is sufficient the fourth day.

Hay is always best that is sufficiently dried, not to heat much in the stack, it then goes in green and comes out green. Such is the London hay, and that is ever esteemed the best.

Meadows that are flowed, have a long stalky grass full of joints when good, which retain the juices some time; if such grass be turned till these knots or joints are dry, in order to prevent heating, the other parts would be burnt up and spoilt. Such grass should be carried as soon as the leaves are well withered, it then heats in the stack, and when cut is chiefly of a pale dingy red colour, smells well, cattle eat it greedily, and it does double the good it otherwise would.

It is bad farming to make the latter-math into hay, let it be ever so long and thick; for be the weather as favourable as it may, such grass not having sun and time to harden it, is, after all, soft and wooly, without nourishment, and though cattle are fond of it, it will starve them. Besides, it robs the land of the dressing it would receive by the urine and dung of cattle that feed it down.

The closer grass land is fed down the better. Care should be taken not to turn in horses and cows after Christmas, if the weather is wet, to poach it, but sheep may follow heavy cattle, and their tread will work it, and do it much good.

Where meadows can be readily flowed, it is a great advantage to farmers to do it.

J. T.

CHAP. XVI.

ON BURNET.

AS Burnet is a good winter pasture, when pasture is wanted, produces a great crop, and continues long in the ground, it is well worth a farmer's while to try a few acres of it, particularly as it will flourish on light, sandy, or chalky land.

It may be sowed either in drills, or broadcast. It may be sown with barley or oats, but it is not so strong as if sown alone. It rises from 14 inches to 2 feet in height, and perfects its seed three times a year in June, July, and Autumn. The quantity of the first crop of seed is about 40 bushels per acre; and its value, if sold, 6d. per lb. Six ounces of seed fills a pint measure, of course a bushel will contain about 24 lb. and is worth 12s. 40 times 12s. is 24 lb. But as it cannot always be sold, it is necessary to know that the seed is nearly as good as oats for horses, and they eat it well: thus an acre will at two mowings give as good as 10 quarters of corn, besides three loads of hay; for horses will eat the haulm, and thrive upon it with half the allowance of corn.

If sown broadcast the quantity of seed per acre is from 12 to 14lb. but it is best drilled, when less than half the quantity will do. The land should be clean, fine and in good heart: the seed should be drilled in rows 10 or 12 inches a-part, and the seed set about $\frac{1}{2}$ an inch deep. The time for sowing it is in March or April, when the land is dry and the mould fine. Some say 4lb. of seed is sufficient for an acre drilled, because 4lb. of seed contains about 350,000 seeds, in the husk of which, if only 2-3ds are saved, it gives about 5 good seeds to a square foot; whereas one plant in a square foot is enough.

When

When up, hoe it and set it out as turnips, to 10 or 12 inches apart, leaving the stem of the plant, and this in dry weather; hoe it again as the weeds rise, all the summer. Deep hoeing, after the first summer, in broadcast hoeing, is unnecessary. Burnet is a bushy plant, spreads much, and no common weeds can thrive under it after the first year.

Horses, black cattle, and sheep, are fond of it; it will not hurt them like clover. It will cure sheep of the rot; is excellent for milch cows, increasing their milk, improving the quality, and making extremely fine butter.

It will scour some horses, to others it is diuretic. It is wholesome either green or in hay. In some lands it becomes disagreeable to the taste, and cattle will not eat it; the land should be first tried therefore with a small quantity.

On feeding burnet with sheep, the ground fills naturally with trefoil; this last the sheep will eat in preference, till they are used to the burnet. It is not liable to be injured by treading, of course will pasture heavy cattle, at any time of the year; nor can it be eaten down too close. It is an evergreen, resists cold, heat, and drought, and is ready for use at all times of the year. It vegetates in winter, even in frost and snow, though at such times slowly: it should, therefore, not be fed down too late in autumn, but allowed to rise six inches or more. In winter this will not waste, but grafts and continue fresh, and will afford good feed in March and April, when feed is wanted. It should be well dressed the end of January or beginning of February. That crop of burnet lasts longest which is constantly fed. If after it is fed down, it is rolled and laid smooth, it may be mowed in spring to soil cattle with. Indeed, if dressed occasionally, it may always be carried into the house and eaten green.

After twice mowing, burnet, like other crops, requires dressing, which should be powdered; as chalk, lime, ashes, soot, &c. of course top dressing.

If cut for hay, it should be done just before blossoming. When made into hay, it should, if showery, be treated as clover hay; when ricked, leave a tunnel in the rick, which, if the rick is small, should be covered when the hay has done sweating.

The seed being apt to shed when mown for its seed, it should be cut when the dew is on. Not only the haulm is good fodder; but the chaff mixed with other chaff is also good.

Six men and two boys threshed and cleaned $7\frac{1}{2}$ acres in seven days. This yielded 300 bushels of clean seed, 200 sacks of chaff, and 7 loads of hay or haulm. Ten days after the $7\frac{1}{2}$ acres were cleared, it fed 7 cows, 2 calves, and 2 horses, till Michaelmas; then being rested till November 15, it produced a good crop again, and fed 6 head of cattle till Christmas.

When other pastures are burnt up, burnet will flourish green, and grow away as if showered on weekly. After the first year the expences it merely the harvesting and occasional dressing.

An Estimate of the $7\frac{1}{2}$ Acres.

	£.	s.	d.
Rent, tithes, and taxes	7	5	0
Team	7	5	0
Mowing, 1 <i>s.</i> 6 <i>d.</i> per acre	0	11	1 <i>½</i>
Getting in, additional labour, 2 <i>s.</i> per acre	0	14	6
Six men and 2 boys	4	18	0
	<hr/>	<hr/>	<hr/>
	20	13	7 <i>½</i>

PRODUCE.

	£.	s.	d.
300 bushels of seed, valued as oats only, but going farther, $27\frac{1}{2}$ quarters, at 2 <i>s.</i> per quarter	45	0	0
200 sacks of chaff, at 1 <i>s.</i>	10	0	0
7 loads of hay, fodder at 3 <i>s.</i>	10	10	0
	<hr/>	<hr/>	<hr/>
Carried over	65	10	0

several weeks must be allowed for the return of the land.	Brought over	65 10 0
3 months feed to Michaelmas, for eleven head of cattle, at 8s. per month each		3 13 0
6 weeks for six head, to Christmas, ditto		3 8 2 0
and 300 bushels of straw & 100 gallons of water		82 6 0
Deduct expences as above		20 13 7 1
as to 300 bushels straw & 100 gallons water		
Profit		61 12 4 1

Here is a profit of 61. 6s. 8d. per acre; and as 7s. 5d. is charged for the team, which was employed only for getting in and carting the dung, and which in fact was not worth 4s. the remaining 5s. if divided between the 7 acres, would make the profit 9s. an acre, twice as much as can be cleared from an acre of meadow. Could the feed have been sold at 10s. a bushel the produce of that alone would have been 250l. or more than 20l. an acre. But the convenience of such feed is of more value than all the rest.

CHAP. XVII.

OF PLOUGHING AND HARROWING.

IT is necessary to make some few observations on this head, both as to the nature of the ploughing, the time when, and the number of ploughings.

I would, in the first place, recommend it to every occupier of land, to employ a very good ploughman, one who knows how to plough and sow well, and one who will not want watching. A team of two horses in light, and four in stiff land, will plough an acre or more, in the course of a day; one acre is the customary allotment of a day's work, and is

generally performed in eight hours. The team usually leaves work at two o'clock ; but it is better for the horses, in summer time, to get to work at four or five, and quit before the heat of the day.

All that is necessary for a master to take care of, is, that his ploughman does not ride upon the handles of the plough, but plough the ground as deep as the plough will effect it, or as the upper staple or layer of the land will admit.

Plants that have tap-roots, as beans, carrots, &c. thrive best in deep earth, which has induced many to trench-plough their land ; but, for corn, the common depth of five inches is preferable to deeper ploughing. As I said before, I am no advocate for turning up the clay or gravel, and mixing it with the mould : and for this reason ; that it will require a long series of tillage, to bring such soil as is thus turned up into the same state with the surface ; and it is contrary to the general practice of husbandry.

We are next to take care that the ridges lie handsome, round, and even. In dry soils, the ridges may be broad and flat ; but in wet, moist ground, the higher and narrower the ridges are, the drier it will lie. In wet, clayey soils, I have ever found three or four-bout lands the best, as in harrowing, the horses may walk in the furrows, and thus avoid poaching it. The furrows between the ridges should, when the work is done, lie clean, so that the water can run freely off ; and water-furrows should be made in all depending places, to carry it clean away into the ditches. This cannot be well done, but by the spade, and men should be employed for the purpose ; for unless the crop lies dry, it will turn out a poor one. It is necessary, therefore, to drain all wet banks ; for where the water stands, the crop commonly fails. For the same reason, at the last ploughing, in moist rising land, the furrows should be up and down the hill ; but in hungry, burning soils, it may be proper

to leave the ridges across the hill, in order to hold the water and the dressing, which otherwise might, in heavy rains, be washed away.

As to the time of ploughing, this must be, in some measure, regulated by the weather; for, in wet soils, there are times when the plough cannot go upon the land. In stiff clays, where a winter fallow is necessary to mellow and break the clods, the stubbles should be always broken up in autumn; but, where winter fallows are not necessary, autumnal ploughings may, for want of time, be omitted; especially when the ground is designed for beans or turnips the next year. Such a crop, receiving no very great advantage from ploughing in autumn, the stubbles may as well be left for the feed of sheep; for autumnal stirrings are designed to destroy the roots of weeds by frosts, and to pulverize the land. This is more necessary for barley or oats, than for a crop that can be hoed, as hoeing the ground will effectually destroy the weeds. But, in wet soils, when such autumnal ploughings are given, care should be taken to ridge up the land, and water-furrow it, so as to lay it dry; otherwise, where we mean to do good, we shall chill the land, and do it a great deal of harm.

Farmers vary in their opinions respecting the number of ploughings on different soils. In strong lands, ill adapted to certain crops that thrive best in light ones, as turnips, clover, barley, peas, &c. the more we pulverize the soil the better, which cannot be done, but by many ploughings, rollings, and harrowings; and where we wish to summer fallow, and clean the land from weeds, it is only to be done by frequent stirring it; but, when we mean to sow it with such grain as delights in strong land, as wheat, beans, oats, &c. many ploughings are not only unnecessary, but may be injurious. The same reasoning will hold good in light land, provided it be clean: one ploughing is better for wheat, beans, or oats, than three; but,

where it is necessary to clean the land, as is fallows, or turnep seasons, if the farmer has time, and can do it with his own team, so as not to bestow more expence upon the land than it will pay, he cannot well plough it too much. To omit all of a.

All that is necessary to say, with respect to harrowing, is, that every farmer should have three pair of harrows of different sizes: a large heavy pair for three or four horses, a smaller pair for two horses, and a less pair for one. The great harrows follow the plough, the next size pulverize the land, and the small harrows are chiefly used for harrowing in the seed. The land being ploughed in order to clean it, we cannot well make too much use of the harrows, for it is our busines to bring it into fine tilth, and not suffer a weed to grow.

If the land be not a strong clay, seven or eight acres, harrowed twice over in a place with the great harrows, is a good day's work. Smaller harrows should go three or four times in a place.

CHAP. XVI.

OF WEEDING. *no aggiugno
secolo le quattro, sono i sigilli
della vita, e della morte. I
sono i quattro segni della vita, e della morte.*
IT having been observed, that, clean our land ever so well, time will naturally foul it, and that the carrying on of dung will contribute to such foulness; whatever we find obnoxious weeds rise with a crop that cannot be lived, it should be hand-weeded, by going up the furrows, reaching across the ridges, and pulling up such weeds by the roots; for, were they suffered to seed, instead of one weed, without a fresh fallow, we should have the next year a thousand. Catlock, poppy, docks, thistles, all should be clean pulled out; and whenever we find the

last,

last, even in the hedge rows, they should constantly be cut down before they seed ; we never can have a clean farm without ; for the seed of the thistle is winged, and will fly, with the least breath of air, from field to field. Weeding the crop has saved the necessity of many a fallow, which is the loss of a year's rent, and the annual expence of the team.

Those who study the cleanliness of their ground, will take care to weed their dung-hills from time to time, and sow no grain, but such as is free from the seeds of weeds.

ni bocw ois si eis penei wi to ovi flui hui wu eis hui ovi. 20
eisf gnis hui. 21 eis hui ovi awem gnis hui. 22 eis hui
do hognishui. 23 eis hui ovi awem gnis hui. 24 eis hui
eis hui ovi awem gnis hui. 25 eis hui ovi awem gnis hui.

CHAP. XVII.

OF HEDGING AND DITCHING.

WHAT they call dead hedges, are the customary fences in my neighbourhood ; and I apprehend this method of inclosing fields is very general throughout the kingdom, except in countries where they have plenty of stone, of which they make walls. Gentlemen and opulent farmers, who study more the neatness of their farms, than the article of profit, will plant their banks with quicks, or white thorn. Such a fence, no doubt, is beautiful, secure, when properly grown, and, if cut with sheers once or twice in the summer, will last a great number of years ; but it is certainly an expensive one : for, besides the annual labour of clipping, the farmer loses the advantage he would otherwise receive in the spare wood, which will supply his copper and his oven ; and let a quickset hedge be ever so good, it is not impeneable to hogs.

Dead hedges are fences made by cutting the ragged rambling hedge close down to the bank, repairing the bank by calling the contents of the ditch upon it, driving in stakes between two and

three feet long, filling the lower part with bushes, and weaving it to the top, between the stakes, with hazles, or any pliable sticks of some length. A man will complete four or five rods, or perches, of such a fence in the common way, in the course of ten or twelve hours ; and the customary price with us, is from three-pence to four-pence a rod, and two shillings a hundred for the faggots he makes with the spare wood, with the liberty of taking home a faggot, worth two or three-pence more, each night, on his leaving work. Such a fence, with occasional mending, will last five or six years, till the wood in the hedge is sufficiently grown to remake it. Making this fence is, in fact, attended with no expence, as the faggots obtained at every such making, are generally worth twice the value of the labour.

If the adjoining ditch be sufficiently cleaned out to let the water pass freely, the bank be smooth and tight, and the hedge even and strong, which may be known, by putting our hand upon the top, and shaking it in different places, the fence is well made.

CHAP. XVIII.

OF THRESHING.

SOME farmers choose this business should be done by the day, others by the quarter. Those who are for the first mode, give this as their reason ; that when men work by the day, they generally do their work better, being in no hurry to get it done : whereas, when they thresh by the quarter, they seldom beat the corn clean out. Those who are for the other mode, argue thus : if men thresh by the day, unless the master's eye

is constantly upon them, they will waste their time ; and of course, in the end, he will pay more for his threshing, than if the work was done by the quarter ; and as to not beating it out clean, that is the master's business ; he must examine it, and see that the business be properly executed. In most countries, men wish to thresh by the quarter : as by working hard, and a greater number of hours than is the usual complement of a day's work, they can earn more money in the course of the week. This principle has made it difficult to find men to thresh by the day ; and, indeed, if honest men are employed, I think it most pleasant both for master and man, that the work be done by the quarter.

Where a day's labour is rated at eighteen-pence, the following prices are generally paid for threshing.

	s.	d.		s.	d.
Threshing a quarter of Wheat from	2	6	to	4	0
Barley	2	0	—	3	6
Oats	1	2	—	1	8
Beans	1	2	—	1	8
Peas	1	2	—	1	8

according to what the crop yields.

After the corn is threshed out, the cleaning, or winnowing, is paid for besides. Two men and a boy will clean a load of oats or wheat in a day.

Clover seed is from five shillings to six shillings, threshing and cleaning.

Drawing, weighing, and binding of wheat-straw after threshing, one shilling a load.

CHAP. XIX.

OF MANURING.

MANURING of land is of such importance to the farmer, that he who omits it, must never expect a good crop ; indeed, it

it is the very life of husbandry, and the cultivation of land cannot go on without it. In the neighbourhood of great towns, plenty may be had, and at a very reasonable price. But what are farmers to do, who live too remote to enjoy such an advantage? Where manure is not to be met with on the farm itself, or in its vicinage, a method must be contrived to make it; and this can be done only by keeping as large a stock of cattle as the farm will admit of, and by other modes which I shall point out in a following chapter. I now

Stable dung is one of the best manures; and, if purchased (where it can be purchased), is worth upon the farm from five shillings to ten shillings a load; ten or twelve of such loads is an ample dressing for an acre of land, and will keep it in good heart, if kept clean, for five or six years. To raise then the greatest quantity upon a farm from a given number of horses, is the matter in question. This is to be done by keeping them all the year round in the stable, and littering them well; in which case, a horse will, on an average, make twenty-seven or twenty-eight loads, which will manure three acres well; but to effect this, it will take four loads and a half of straw to each horse; which, if the farm will not supply, should be purchased. Suppose these four loads and a half to cost 3*l.* 7*s.* 6*d.* and to produce twenty-eight loads of dung; the price per load will then be under half a crown. Fern, where it can be got, is a tolerable substitute for straw; but a farm generally yields sufficient litter to make the purchase of it unnecessary. The stubble of the fields might be mowed or harrowed up in frosty weather, and stacked for the purpose.

Farm-yard dung is the next in quality; and where cattle are foddered the winter through, and the yard well spread with litter, they will, upon an average, yield six or seven loads per head, so that two cows will manure an acre. Where cattle are stall-fed for fattening, two beasts will, if well littered

tered, yield about twenty-three loads of dung in the space of fifteen weeks.

It should be a farmer's study to make a compost dunghill at every field gate. For this purpose, he should carry there all the manures he can pick up. Cleanings of ponds or ditches, chalk, earth, clay, ashes, the dung of hogs, geese, pigeons, poultry, brick-rubbish, or any thing he can get, such as the list below points out; this, if well mixed together, with a little lime, and turned once or twice in the year, will turn out an excellent manure for grass, clover, or any other purpose. But he should take care to keep such dunghills free from weeds.

When land is dressed at the rate of ten cart-loads *per acre*, each cart should contain sufficient to make sixteen heaps, as parcelled out in the field; and one such heap should be allotted and sufficient, to cover one square rod of ground, there being one hundred and sixty square rods in each acre. But where the soil is in tolerable good condition, eight loads *per acre* will be sufficient for wheat, as ten loads of good dung may make the crop too luxuriant, and occasion it to fall before harvest. With eight loads, one such heap should be appropriated to rather more than a square rod of land.

As the hedges shelter birds, which often consume the crop; and the corn under them, from its warm situation, is naturally drawn up weaker and taller than in more open parts of the field, and of course more apt to be lodged; farmers seldom dress the head-lands of a field when they crop it with wheat.

The following is a list of manures; with the uses they are fit for, most of which are easily procured in different places.

Horse-Dung. When fresh, for cold stiff clays; when rotten, for all sorts of land.

Cow-Dung.

Cow-Dung. Rich and cooling ; fit for dry sandy ground.
Hog-Dung. Ditto. This is rather too strong of itself ; but is an excellent mixture for the compost dunghill. See Chap. II. on Clover.

Dung of Sheep, Rabbits, Goats, Deers, &c. Very warm good top-dressing. Folding a flock of sheep every night upon fallow ground, is a good practice. Sixty sheep will fold an acre in six weeks, equal to ten loads of dung. If this dung is collected, it should be covered from the sun, that its salts may not be exhaled.

Sheep-Dung is hotter than *Cow-Dung*, and *Cow-Dung* hotter than *Horse-Dung*.

Littered sheep-folds is a Flemish custom. They spread the ground with turf, cut from commons or any weeds they can get them, in order to increase the manure.

Pigeons-Dung. The hottest of most dungs, fit for the compost dunghill, or top-dressing ; 8 bushels per acre.

The pigeon-house should be strewed with litter to increase the manure, and when thrown out, laid on the shady side of the dove-house.

Chicken-Dung. For top dressing.

Goose and Ducks Dung. Ditto. Some think it spoils the grass, because horses do not like to eat where geese have fed ; but this is owing to the strong salts in it. Where geese take to sitting at night in a farm-yard, if the place be daily littered and kept clean, they will in the course of the summer make a great deal of dung.

Human-Dung is of so hot a nature, that it is fit only for the compost dunghill. If rock-lime be thrown into the necessary in January, it will remove the offensive smell, and dry it so as to make it spread.

Human Urine, and Urine of Cattle, Dogs, &c. The same quality as their respective dungs ; and have this advantage, the

that they do not produce weeds; if mixed with as much, or two thirds water, it is a good top dressing, to be sprinkled over land with water carts. Human urine should be daily thrown upon the dunghill, and the draining of such dunghills, with the urine of cattle, should never be suffered to run off from farm-yards, but, if possible, collected in reservoirs.

Dead Animals should be buried in compost dunghills.

Blood from the butchers. A very strong manure; it should be mixed with earth, sand, or saw-dust, for the convenience of carriage, and then used as a top dressing for any land.

Horn shavings, bones, hoofs of cattle, bits of leather, hair of animals, feathers, and woollen rags. Good top dressings for any land.

Salt. Excellent top dressing for most lands. Refuse salt is sold, duty free, for this purpose. It should be sown upon the land.

Lime. A general manure for all lands, stiff or light; excellent to mix in a compost dunghill, as it makes the mals ferment and rot.

Chalk. Good for all soils, but best for clay or moist ground; eight or ten loads an acre. Put some, if possible, in all compost dunghills.

Marl. A general manure, but excellent for dry, sandy, gravelly, or light lands; good even for mossy ground and clay, if well dissolved. Will make white clover come naturally. Happy is the farmer who has a marl-pit in his grounds!

Sea Sand. For cold strong clays. It is full of salt.

Saltpetre. Is a good manure, and the earth will naturally breed it, by planking it over, keeping it from the sun, and from its growing any vegetable.

Oyster Shells and *Sea Shells*, small or ground fine. For ditto. 80 barrels per acre holds for some years.

Sand

Sand. For stiff clays. about two bushels ton of sand

Clay. For sandy land, or when mixed with lime or ashes, for most soils.

Gravel. For stiff clays and boggy ground. If full of large stones, screen it.

Road Sand, or the *Slush of Turnpike Roads,* when dry, this is generally thrown up in small heaps to dry on the roadside. Any one may cart it away. It is the stones, with which the road is mended, ground to powder. Found good manure for meadow land, brings good crops of grass. This is laid on near an inch thick. It makes good garden walks, binds firm, can be readily cleaned, and dries to a good colour.

Lime rubbish and *Brick rubbish.* For stiff clays and boggy ground.

Rotten wood, and Saw dust, Tanners bark and Willow-tree earth. For stiff clays.

Leaves of trees. When rotten, put them in heaps for this purpose. We see that grass, where leaves fall, seldom requires dressing. These would be better, if mixed with rotten chaff.

Wood soot, Coal soot, and Malt-kiln dust. For cold stiff clays, to kill rushes in meadows, and for top dressing to corn in spring. Soot and malt dust may be bought for six pence or seven pence per bushel; and twenty or thirty bushels will dress an acre well. (Soot is now eight pence per bushel, 1798.)

Wood ashes, Ashes from green vegetables, Potash ashes, Peat ashes, Charcoal dust, Turf ashes, and Soap lees, are good top dressings, being full of salts. They should, if possible, be kept dry till used. Soap lees sprinkled on fern will destroy it.

Soap boilers' ashes, Which may be purchased for about three

three shillings per cwt. will effectually destroy thistles in grass lands, by mowing the thistles, and sprinkling the ashes lightly over them.

Coal-ashes. For cold stiff clays, either meadow or arable land, and will produce red clover naturally. If not very fine, put a little unslaked lime among them, and it will reduce them to very fine powder.

Chippings of Stone and Marble. For clay land.

Sea-weeds. Very full of salts, and should be ploughed in directly, or made into a dunghill mixed with earth, lime, &c.

Weeds of all sorts should be burnt for ashes, if their seeds are ripe; otherwise, for the compost dunghill.

Fern carried into a farm yard to rot, or laid on ground on which sheep are folded, is a good manure, carted off in September or October. Fern dung naturally breeds marsh-mosses.

Offals of a Kitchen Garden and sweepings of short grass. For the compost dunghill.

Sweepings of Streets. For meadow-land.

Sweepings of Herb-markets. For the compost dunghill.

Offals of Fish. For ditto.

The Roots of Cauch, or Scutch-grass harrowed from lands. For the compost dunghill, laid to rot, or burnt upon the land.

Mud of Rivers, Fish-ponds, and Ditches. For dry sandy ground.

Ant-bills. For the compost dunghill.

Oil-cakes. A good top-dressing; are frequently imported from Holland; fifteen shillings worth spread on an acre will dress it well.

Hops from brewers. For clays.

Grains from ditto. Good top-dressing.

Burnt Clay

Burnt Clay. A very convenient manure, after making new ditches on clay lands; a little brush-wood will burn a great quantity. See the method of burning it in this work.

Sweepings of a dog-kennel. For the compost dunghill. old
Buck-wheat, Tares, Rye, Clover, and Everlasting Pea.
To be ploughed in when going to blossom.

Turneps, ploughed in at Michaelmas.
Urine of all sorts, brine of salted meat, and pickled fish, soap suds, liquors from dye-houses, salt and water, blood and water, or the washings of a slaughter-house; for top dressings, but, when too strong, should be diluted with water.

Flower of Brimstone and Water. Good to sprinkle over turneps, or soak the seed in before sown, to prevent the fly.

Heat and warmth is a great help to ground. The ancients used to burn heath, sedge, and ling, upon it. Hence Den-shiring of land, that is, paring and burning it.

Note. The compost dunghill may be a mixture of any sort of manure; but if lime be mixed with every layer, it will make it ferment and rot the sooner. It should be made in a shady corner, if possible, or covered over to prevent the sun's exhaling the virtue of the dung; it should, as I said before, be frequently turned, and no weeds be suffered to grow on it.

Twigs, boughs, and straw, laid upon dunghills, will preserve them from the action of the sun.

CHAP. XX.

MISCELLANEOUS OBSERVATIONS AND EXPERIMENTS.

Part of the following observations have appeared in the country almanacks I have published, since 1787. Some are experiments and remarks of mine, and some of other people; but they will tend to amuse those gentlemen who are disposed to try experiments.

ON MEADOWS.

TO make meadows, or pastures, flourish, they should be cut for hay only once in two years: the second year they should be fed, unless they are dressed.

The best mode for laying down pastures is to sow Dutch clover, the meadow fescue-grass, the meadow foxtail, and a little rib-grass. It should be sowed in August without hay-seed or any other thing, except a little trefoil. Hay-seed is generally full of weeds. The next year, if the land was clean before, the crop will be a very good one, and the land worth 40s. an acre.

ON COWS AND OXEN.

A milch cow will require an acre and three quarters of good meadow, or two acres of indifferent pasture, to keep her well from May 1, to October 31; or one acre and a half of clover green, will keep her twenty-three weeks, and enough will be left to keep two sheep six weeks. She will eat, when fed on hay, forty pounds weight a day upon an average; which for the winter six months, is four loads and a half. Straw, and fifty pounds of turneps per day, will keep her well before calving.

F

A milch

A milch cow will eat, from the end of October to the middle of March, that is $4\frac{1}{2}$ months, 2750 large drum head cabbages, that is about 16 a day, and these may be grown on a quarter of an acre of good ground.

Cows may be fed with advantage, if they are kept in summer time in the house, and fed with green clover, and turned out at night. Much less grass will suffice, more manure is obtained; and cattle is in better condition than when at pasture day and night. In winter they may be fed with turnips, straw, and boiled chaff. Boiled linseed is a cheap food, and has a capital effect. It is the practice of Mr. Johnson of Hill-House, near Kirk Newton in Mid Lothian, Scotland. A Scotch peck of linseed may be bought for 2d. this is sufficient to make 45 Scotch pints of water almost a jelly, by boiling it down to 40. It is strong and nourishing, and cows will eat it with much avidity.

Half an acre of turnips, drawn, will keep a cow well, from Nov. 1, to March 31, five months.

To make Cows dry.

Put six ounces of white rosin, well powdered, into a quart of water over night; bleed the cow and milk her in the morning, and give her the above rosin water; turn her out to grass, and milk her no more, and she will become dry. Mr. T. Davis of Goss, has tried it often, when he wanted to fatten them for the butcher, and he says it never fails.

Oxen may be fattened with linseed oil and bran. An ox of 100 stone will eat a pint and a quarter of oil mixed with two pecks and a quarter of bran daily, at three feeds; the oil at three shillings a gallon, the bran at eight pence a bushel, that is about thirteen pence a day, besides half a trunk of hay; so that it will nearly cost 4l. 4s. to fatten such an ox, in the course of twelve weeks. This is rather cheaper than giving them

them oil cakes, and the meat is equally good, and it fills them as well.

Bullards, brought up near home are better than strangers, because they are neither troubled with change of air, water, nor pasture. A just observation, though little attended to.

In many places they feed their oxen with the branches and leaves of trees, viz. the green branches of elm, oak, poplar, and holly in winter; when other green boughs fail, the fir-tree will serve, or the bronzing of oaks or holly.

The greatest want of ground cattle is to range the better. One field of ten acres will fatten an ox, keep more cattle than two fields of five acres each.

Mr. Burgoyn, near Harlow, Essex, feeds his oxen with potatoes boiled in steam; his apparatus consists of a small copper, covered, with a pipe that conducts the steam some feet into two tin boilers full of potatoes. With him three pecks of coals will boil eighteen bushels of potatoes in twelve hours; one person attends the boiling, but two are necessary to take off the kettle full of potatoes. One bushel of coals has with great attention boiled 60 bushels. Steam, however, is so extensive that a small copper of water might be contrived to boil 20 bushels at a time, with as much ease and expedition as five.

He fattens some with raw potatoes; and the following is one of his estimates. A large Suffolk ox weighed 160 stone on turning out in May, and when taken in, November 3, weighed only 154 stone 5 lb. a proof that grass did not bring him forward. He was too large for grain. November 3 he was put up and stall-fed, with raw potatoes. He ate two bushels a day, and 16lb. of hay, in the first month after furling; he gained in weight 10st. 3lb. which at 3s. a stone is 12s. 6d. per ox weekly, and 22s. 6d. per ox yearly, with grain.

M. B. he will weigh with known of between forty and fifty

quarts of good milk (say sixty-five) to make five pounds and a quarter of good butter; which, at nine-pence per pound, is worth three shillings and eleven pence farthing; whereas, the same quantity of milk sold at one penny half-penny per quart, would yield eight shillings and three half-pence; but, in the first case, the skimmed milk is left for hogs, which may be fattened, if they have plenty, on that alone: and in feeding of hogs, skimmed milk will pay about one halfpenny a quart.

In dairies where cheese is made, butter is generally made of the whey-cream; and in dairies where butter is made, a blue milk cheese is usually made of the whey-curd.

In buying store-beifers, take care they are not bulled before you buy them. A sure token to know they are bulled, is from their having wax in their teats, which may be brought out by drawing them between their fingers. Observe also the barren under the tail, if there is a drop hanging at it, which generally gathers dirt, depend upon it she is bulled.

A Comparative Estimate of the Profits of a Cow between selling the Milk, converting it into Butter, or sucking the Calves.

Two aerts and a half of good meadow grass is sufficient to keep one cow the year round, one acre of this is alternately to be laid up for hay, the other acre divided into three parts and fed. I mention this not so much to advise it to be done with a single cow, as with many. The profits of any number of cows may be gathered from this estimate. I will suppose her to calve at the end of April, and go to the bull at the end of July.

A middling cow, four years old, such as is bought now (1798) with a calf by her side, for £10 16s. will, in good keeping after calving, yield ten quarts of milk in the morning, and seven in the evenings; and this for three months, that

PRACTICAL HUSBANDRY.

is better than four gallons a day, and in the 7th, 8th, and 9th month after calving, will give five quarts in the morning, and three in the afternoon, that is two gallons a day. Let us take the average for nine months, and this will be three gallons a day, for 39 weeks, the other three months we will suppose her dry.

(See table on p. 111.)

Produce on milk where it can be sold for 2d. per quart.

	L. s. d.
Three gallons of milk daily for 39 weeks, at 2d. per gallon	27 6 0
The calf sold at three or four days old	0 18 0
	<hr/>
	L. 18 4 0

EXPENCES

	L. s. d.
2 <i>1/2</i> acres of grass at 40s.	5 0 0
Taxes	0 12 6
Tithe	0 7 0
Bullock	0 1 0
Making an acre of hay	0 7 6
Stacking, &c.	0 3 0
Year's loss on the value of the cow, 7 <i>1/2</i> per cent.	1 5 6
One man servant will attend 16 cows at 10s. a week	12 6 0
	<hr/>
	Profit L. 18 15 0

Note. The acre of grass should produce one load and a half of hay, which it will do with the dressing of the cow, if housed for three months; this is three trusses a week for four and a half months; but half an acre of turnips will keep her longer than this, and these may be bought and brought to the stall for £.3 or less, in which case there will be a saving of 30s.

PRACTICAL HUSBANDRY.

PRODUCE IN BUTTER.

		£.	s.	d.
Such a cow as above will yield				
For 13 weeks 9lb. at 1s. the price	1798	6	17	0
— Ditto 7lb. Ditto		4	11	0
— Ditto 5lb. Ditto		3	5	0
— Ditto dry the calf		0	18	0
52 weeks.			15	11
				0

Skimmed milk and butter milk, at ad. per gallon to feed pigs, $2\frac{1}{2}$ gallons per day, 39 weeks 2s. 11d. per week, say 3s.—5l. 17s. from this deduct 5s. 6d. for salt in the butter. 5 11 6

	£.	s.	d.
Expences as before - -	£9	9	
Add maid servant's wages and board 24s. to 16 cows -	1	10	
		10	19
Profit. £.10	3	6	

But that pigs fattened on milk will pay two pence a gallon, the skimmed milk, will appear as under.

The average quantity of milk three gallons a day. A pig of five stone weight bought in at 3s. 8d. per stone and sold at twelve stone at the same price, will, on an average, fatten six quarts a day, that is three gallons for two pigs; of course, one cow in nine months will fatten six pigs.

	£.	s.	d.
Value in pork for fattening 6 pigs, at 7 stone each, at 3s. 8d. per stone	7	14	0
2 gallons of milk per day, at 4d. per gallon	6	13	0
£.1 2 0			

leaves an overplus of 1l. 2s. for barley meal or fig-dust, to help out, though milk alone will fatten a pig sufficiently for pork.

Profit

Profit on Suckling Calves.

A calf, to be made fit for the butcher, will suck the milk of one cow for nine weeks, and half the milk of a second cow for six weeks, which say is equal to the milk of one cow for 13 weeks; of course such a cow as above will only fatten three calves.

	£. s. d.
Suppose then a calf of 13 weeks old, shall weigh 17 stone, at 4s. a stone, i. e. 3l. 8s. each, or for the three	10 4 0
Three calves at a week old, including her own, at 18s.	2 14 0
Expences as before	7 10 0
Here is a loss of	9 9 0
	<hr/>
	£. 1 19 0

How is this? Farmers generally reckon the profit of a cow for suckling, to be about 6l. a year; but they must deceive themselves in this, or they do not rate the expences so much as they are at. Sometimes a cow will fatten her own calf, and probably a second, or nearly so, and it will not require the whole attendance of a man to attend 16 cows: the three months they are dry, his time is saved. Perhaps they do not estimate their grass land at a higher price than their arable; perhaps 20s. an acre or less; perhaps they do not allot $2\frac{1}{2}$ acres to a cow, but turn them out half their time upon a common; nor do they perhaps reckon any thing for a servant's time to attend; and instead of giving them hay when dry, they may turn them into a straw yard. All I can say is, that this is a fair estimate, and if a saving of expence can be made in one case it may in another; and it serves to shew, that the 6l. they say they gain yearly by the above means, if added to the produce by milk,

will make it 24l. 15s. instead of 18l. 15s. and if added to the butter 15l. 3s. 6d. instead of 9l. 3s. 6d. In this way, according to their own reckoning, the comparative profits will be as follow:

	£.	s.	d.
By suckling	6	0	0
Butter	15	3	6
Milk	24	15	0

Hence it appears, that in dairy farms where butter is made, 125 acres of rich grass land, keeping 50 cows, will give a profit of 537l. 10s. per annum; and there are butter factors that will engage for the whole. In countries far distant from London, from whence, particularly in summer time, it cannot be sent up fresh and in proper stile; farmers tub it, which considerably lessens their profit; for independent of salt and tubs, it will sell for 2d. or 3d. a lb. less than fresh butter; but in such places, grass land is cheaper, and also other articles of living; or they make it into cheeses. Indeed, except in the vicinage of great towns, it is difficult to sell milk; but milk sold at 1½d. per quart, will considerably more than double the profits of making butter, and at far less trouble.

The Advantages of Feeding Milk Cows in the House.

A paper sent to the Board of Agriculture by Baron Alven, a Hanoverian nobleman.

In order to this, the cows should be early trained to it, otherwise they do not thrive. A large cow, such as we see about London, requires near four acres of good land to feed it entirely abroad, summer and winter; and in this case the ground will be poached in wet weather, the grass hurt by being bruised.

bruised instead of being cut, and the manure will not be half so much or so useful.

But stall-fed with clover, green or dry, two acres of cut land is sufficient to maintain it. An English acre each should produce ten ton weight of green clover, or $2\frac{1}{2}$ ton of clover hay. Now such a cow will eat 110lb. daily of green meat, or half a truss of hay, which two acres in good heart will produce. But they may be fed with lucerne, burnet, potatoes, turnips, carrots, cabbages, peas, or beans.

Currying them as we do horses when stall-fed, and keeping as clean as horses in a stable, is attended with the first consequences, both in regard to the milk they yield, and the rapid improvement of their carcase.

Large cows, such as have been mentioned, kept in the house and properly fed, ought to yield nine gallons English, per day, for the first four months after calving. After this time the milk will gradually grow less and less.

But suppose such cows yield on an average only 6 gallons a day for 9 months, or 252 days, which, at 8d. a gallon, produces 4s. a day, or in 9 months, is 50l. 8s.

If milk cannot be sold, the profit will be rather less, but still very considerable: 5 gallons English should produce 2 lb. of butter. Hence in all 604 lb. at 1s. a lb. worth 30l. 4s. The butter milk and skimmed milk will be worth 2d. a gallon for fattening pigs, that is, 1s. a day for 252 days, is 12l. 12s. total, 42l. 16s. per cow. Fed on 2 acres, yields 21l. 8s. per acre.

Milch cows, if fed with straw, and one peck of potatoes a day, in the winter, will give more milk, and the butter made from such milk, will have the yellow colour, and will be sweeter than when fed on hay.



O N

PRACTICAL HUSBANDRY.

ON OXEN AND COWS.

Oxen for draft require cleanliness of limb, thin neck, light shoulders, depth of carcase and chest, light or no horns, wide nostrils, and thriving constitution.

The best heads are the Herefordshire, Gloucestershire, Yorkshire, Sussex, Devon, and Somersetshire, all the middle horned.

Cows to be good require small horns, long, fine, green and spreading; clear of leather under the chops; good shoulders; long quarters; wide back; deep chested; spine straight from wither to tail; thighs thin and standing narrow at the round bone, that they may calve easily, and produce fine calves; broad ribbed; thick skin; udders large when full, loose and thin when empty, with large milk veins to fill them, and long elastic teats for easy milking; legs below the knee straight, and not too long, their bone light, and not fleshy, but strong in joint and sinewy.

A cow or ox throws off the tip of its horns at three years of age; at four years a ring or wrinkle is seen round each horn, near the base; and every future year adds a fresh ring; thus, two rings denote five years old, three rings six years, and so on.

ON CALVES.

A yearling calf will eat about five pounds or six pounds of hay in the course of the night, by way of fodder in winter, i.e. half a load in six months. To make them grow, they ought to have the best hay. Give calves plenty of skimmed milk, and they will grow away apace.

Calves may be weaned with very little milk, by the following method.

The first eight days after they are calved, they should suck the cow. They should then be taken from the cow, and the next eight days fed with new milk. The next eight, you may give

give them three parts new milk, and one part hay-tea mixed; made by steeping the best hay in hot water, and letting it stand till it is cold: the eight following days give them half new milk and half hay-tea; the next eight, three fourths hay-tea, and one fourth milk; and after this, nothing but hay-tea till they will drink water. During this time, they should have a little fresh hay put daily before them, to tempt them to eat; and, in the last three weeks, they should be turned out into grafts, that they may learn to feed. One cow will thus wean several calves. Calves so weaned will thrive well, and grow, but not equal in size to those that run with the cows all the summer, or fed with skimmed milk.

But they may be weaned without milk, thus, boil one quart of linseed, 10 minutes, in six quarts of water, it will make a good jelly; and mix this jelly with a small quantity of the best hay tea. Linseed is 4s. 6d. a bushel, and 10 bushels will serve 55 calves, which is about 10d. a calf. It rears them better than milk, and they do not fall off when turned to grafts.

If calves scour, give them powdered chalk and wheat meal, worked into a ball, with gin.

ON SHEEP.

To such as wish to keep sheep, the following estimate will be acceptable.

	L. s. d.
Fine large ewes with lamb, may be bought in at Michaelmas, at about twenty-two shillings each, which, in July following, will sell again for -	1 1 0
The lamb will then sell for -	1 7 0
The wool of the two, shorn before sold, will sell for about -	0 3 0
	<hr/>
Deduct the first cost -	2 11 0
	<hr/>
Leaves profit -	1 9 0

Sheep may be fed on stubble till Christmas, where grass is not plentiful, and then on turneps till May-day; next on rye, and then on clover, till they are sold. No meadow will do for sheep in the winter, that is wet enough to let them sink up to the first joint of their legs; it will rot them.

An acre of turneps will feed one hundred sheep for ten days; or about eight sheep from Christmas day to May-day. But one hundred sheep for a year, it will require five acres of turneps and fifteen of clover; that is five to an acre. Inclosed pasture will carry six to an acre. A folding stock of 500 without the run of common land will require fifty acres of turneps, good dry land, 130 acres of clover, and five loads of hay. One acre of good turneps will fatten ten wethers, or keep ten ewes with their lambs.

A good acre of grass, when sheep fatten kindly, will fatten fifteen wethers, which for home consumption is valued at seven or eight pounds.

Sheep require a large range of pasture: two acres and a half of grass, and two and a half of stubble, be they ever so bare, will keep a sheep all the winter till March.

Twelve pounds weight of hay will keep twenty sheep and their lambs a week.

An acre of turneps will keep forty sheep three weeks: as much as they will eat to fatten them, if in good condition before.

Dung of Sheep, when folded upon land, for the richness of the manure, is equal in value often to the profits arising from the sale of them. Threescore sheep folded every night, will manure an acre of ground well in the space of six weeks.

Further Remarks on Sheep.

There are seven sorts of sheep; 1. Dorset; 2. Wiltshire*; 3. Lincoln, Leicester, and Northampton; 4. Teeswater;

water; 5. South Down*; 6. Norfolk; 7. Hants*; and 8. Mountain.—Those marked *, are generally used for folding-land, the others not.

1. The Dorset are very woolly, short legged, rough head, round horns sticking out from their heads, and are bred in fine hilly downs. They require a short bite, and are the tenderest of all sheep. They produce good house and grass lamb, and about 4 lb. of good wool.

2. The Wiltshire have high long legs, short wool, bare bellies, bare white faces, horns falling backwards behind their ears, close to the head. These are hardy, but require a short bite. They are chiefly bred for stock, and yield about 4 lb. of wool.

3. The Lincolnshire, Leicestershire, and Northamshire, have the shortest legs of all, white faces, and great carcases, and are chiefly kept for stock. They require strong rich pastures that yield a good mouthful, do well in marshes. They have no horns, but a great deal of long wool from eight to twelve pounds.

4. The Teeswater are much the same as the last, and require the same food, but are longer in the leg.

5. South-downers are small, with black faces and legs, and no horns. They are bought for stock, are very hardy and fit for hills; their wool is very short and very fine, yields from two pounds to three pounds, and is worth one penny a pound more than other wool.

6. The Norfolk are middle sized sheep, with horns, long legs, black faces and legs, are bought for stock, and yield from three pound to four pound of wool.

7. The Hampshire sheep are also middle sized, have horns, but longer legs, and not so clear in the bellies; fed like the South-downers.

8. The Welch and North Mountain sheep are very small, have

have long legs and horns, and yet yield from half a pound to one pound of indifferent wool.

The price of stock-ewes is from eight shillings to twenty-eight shillings each ; stock-wethers from 16s. to 30s. each.

There are three ends in rearing lambs : 1. House lamb. 2. Grass lamb. 3. Lambs for stock.

1. House lambs are had all the year round. Lambs kept always in houses and sold at eight or ten weeks old, will fetch from twenty-five to forty shillings, according to the time of year. Fine lambs in winter have sold for near three pounds a lamb. The Dorset breed is best for these, and is as fat.

2. Grass lamb. These lambs in November, December, and January, run out with the ewes, and are sold at four or five months old, from fifteen to twenty-five shillings. Though the Dorset is the best breed for this, all the breeds in England will lamb time enough for killing the better part of the summer.

3. For stock, all breeds will do. They lamb in March and April, and are sold for stock at fairs in autumn, from seven to twenty shillings each.

The feed of sheep in summer is common grass and clover ; in winter, turneps ; and from turneps in the spring, turn them into tares. This is the universal practice. As sheep have false stomachs like cows and oxen, it is necessary to take care they are not hoved with clover, that is, blown up, as they will be, if turned out too early in the morning, before the dew is off, and where the clover is too long ; nor should they be turned out with quite empty stomachs.

Sheep are liable to seven disorders : 1. The rot. 2. The staggers. 3. The red water. 4. The white water. 5. The scab. 6. The foot rot ; and 7. The maggot or fly struck.

1. The rot proceeds from springy ground, the black gravelly land where penny-royal grows, and the fides of ponds and gravel pits. Its symptoms are as follow : the red mem-

brane of the eye-lid looks white instead of red, the gums look the same, and the part on each side the udder or scrotum loses the waxy quality which always adheres to that part when in health, and the wool peels off in the extreme of the disorder. When sheep have it, if turned into feed on turneps, they will die instantly. This disease resembles the jaundice in the human species, the liver being found full of insects, like flounders. To cure it, they should be put as soon as suspected, to dry food. They should not be put on land, where water rises above the fet lock joints.

2. Sheep with the staggers, are seized with a vertigo or swimming in the head, keep turning round, and die in a few days. Lambs so afflicted, are called poddery. There is no cure for this. The poddery affects only the lambs or two teeth. These turn round, but may not perhaps die for two months; whereas, in older ones, it kills at once. This is owing to a grub like a maggot between the horn and the skull.

3. The red water seizes sheep suddenly, and carries them off immediately. This is bloody urine, supposed to arise from eating noxious herbs; sometimes it is owing to white frosty mornings in autumn, or to dew damp. To cure it, take salt petre, allum, or sulphur, of each an equal quantity, one half the quantity of bole annopiac, finely powdered, and give two ounces every six hours in a pint of forge water. Keep them in a house littered.

4. The white water is the same as the red, except in colour, but not so bad. Those that die of the red, stink immediately; not so the white.

5. The scab is a sort of surfeit, resembling the itch insect, and proceeds from poverty, over-driving, thick folding, heat or insects. Young sheep are more apt to pull their wool out than old ones, and then the insects seize them. The cure is

to rub them with tobacco water; if this is not done, all the wool will peel off. *Note.* The tobacco water must be rubbed in when the skin is dry.

6. The foot rot arises from wet pastures, and is a soreness between the claws. This disorder is catching, owing to heat, suckling houses, hot dung, on wet ground not more than dry. When very bad they will crawl upon their knees.

Wash their feet well with water strongly impregnated with oil or spirit of vitriol; if too much vitriol is accidentally applied when at pasture, the dew will prevent any bad consequence. Once washing is sufficient.

7. The maggot or fly-struck, proceeds from being fly blown, and if not cured immediately will eat into the entrails in 24 hours. The cure is common sublimate and turpentine, dropped in between the wool and rubbed in. The fatter the sheep are the sooner it destroys them, owing to their sweating more than the leaner sheep.

GENERAL REMARKS.

In rainy weather sheep should not be folded, but suffered to shift for themselves under hedges. In Wiltshire, in lambing time, they bring them into yards, part of which are covered.

Shepherds are generally allowed to keep a small number of sheep in proportion to the flocks, and have the fleeces of those who die accidentally.

Stubbles. To make the most of stubbles; turn geese into those of oats, and pigs into those of beans: each must have water to have recourse to, or they will not thrive. Where there is no pond, place a trough or two. One month in an eat stubble will fatten geese well.

Weight of wheat, &c. A bushel of wheat, weight sixty pounds standard (eight gallon measure) when ground into meal, and

and dressed into fine flour, gives forty-five pounds, (and twelve pounds of bran,) which, when baked, will yield fifty-eight pounds and a half of bread.

Three pounds and a half of flour makes a quartern loaf, weight 4 lb. 5 oz.

Note. Twelve ounces of yeast, and four ounces of salt, to half a bushel of flour.

A bushel of good wheat, eight gallon measure, will weigh fifty pounds and better.

ON THE PRICE OF LABOUR.

THOUGH the price of labour differs a little in most counties, the following prices in the county of Surry, may lead gentlemen to judge of its value in other places, especially if they take into the consideration the price of day-labour, which is there, in the winter, one shilling and four-pence; in the summer, eighteen pence. I am speaking of the year 1790. The prices are now proportionably raised, near 25 per cent.

	s. d.	s. d.
Threshing a quarter of wheat (nine gallon measure) from	2 6 to 5 0	
Barley, ditto	2 0 to 2 6	
Oats, ditto	1 2 to 1 6	
Horse or tick beans ditto, from	1 0 to 1 6	
accouting to the goodness of the crop.		

Note. Cleaning the above, is always paid for apart.

Threshing and cleaning clover feed, fit for sale, from five shillings a bushel to six shillings.

Setting tick-beans by women, six-pence per peck; horse-

beans, eight-pence. An additional penny a peck, if the setters cover them in.

Reaping wheat, from seven shillings to twelve shillings an acre, according to the crop, and whether it be lodged or not.

Mowing barley with clover mixed, about two shillings and six-pence an acre.

Mowing oats, one shilling and six-pence, or two shillings an acre, according to the crop. Two shillings and six-pence if they are much lodged.

Mowing grass, two shillings and six-pence an acre; three shillings if flooded or lodged.

Cutting beans five shillings or six shillings an acre, according to the crop.

Hoeing turnips, six shillings an acre the first time; four shillings the second. An active man can earn at it three shillings and six-pence, or four shillings a day.

Hoeing beans, five shillings an acre, if set in rows; six shillings, if broad-cast.

Cutting and making faggots of furze, three shillings a hundred.

Cutting of turf for fuel, two shillings a thousand.

Felling a timber tree, one shilling; cutting up the tops, and making them into faggots, one shilling and six-pence a hundred; and one shilling and six-pence a load for the stack-wood.

Grubbing roots, five shillings a load, and nine-pence a square rod for breaking the ground.

Note. A load of stack-wood, is a pile three feet high, twelve feet long, and four feet over; or three feet high, three feet over, and sixteen feet long.

Making inside dead edges, three-pence half-penny per rod,

and

and

and a faggot per day. Outside hedges, next roads or commons, four-pence per rod, and a faggot.

Note. Sixteen feet and a half in length, is a rod.

Throwing out gravel from a pit, four-pence a load.

Spreading dung upon land, one shilling per acre.

Binding hay, two shillings a load.

Binding straw, one shilling a load.

Cutting a waggon load of fern on heaths, four shillings.

For this the cutters help to load the waggon.

Cutting chaff, one penny a bushel. Some men can cut forty bushels a day.

Thatching hay-ricks, one shilling for ten feet square, and one shilling and four-pence for bean ricks. If the thatcher finds the pins, he has two-pence a square more. Two men can thatch eight or nine squares in a day.

Washing and sheering a score of sheep, three shillings.

Digging new gipes or water-trenches in meadows, the width and depth of the spade, one penny per rod; cleaning out old ones, a half-penny.

Ploughing light land, five shillings or six shillings an acre; stiff, from seven shillings to ten shillings.

Withs, to bind faggots, are six-pence a hundred.

Common hurdles five pence each; higher ones seven-pence; gate hurdles of oak, three shillings and eight-pence each.

The price of making a dozen of such hurdles as are commonly sold for five shillings a dozen, is one shilling and three-pence, and one shilling and six-pence for such as sell for seven shillings a dozen.

Stakes for hurdles, three shillings a hundred; five feet stakes, five shillings a hundred.

Edders to weave the tops of dead hedges, two shillings and six-pence a hundred.

To measure Hay in the Rick.

TRUSSES are cut three and a half feet long and two and a half wide, and if the rick has sweated as it ought, will be so close as not to exceed eight inches in depth; some will be nine inches, and often they are twelve.

But suppose the rick in good condition, and allow eight inches from the bottom to the slope, and nine inches thence to the top. If a solid cut has been taken from the rick all the way down in proportion to the contents of that cut, we may come at the exact produce of the remainder; but if not, we must proceed thus:

Note. As the roof slopes away to a ridge, we must in this part, allow two trusses for one, that is, reckon only half what it would contain, if it ran up square.

EXAMPLE.

What is the contents of a rick 35 feet long, 20 broad, and 20 high, that is 10 feet to the slope, and 10 feet from the slope to the top?

Now 35 feet contains 13 trusses in length, of 3*1*/*2* each.

20 ditto 8 ditto breadth of 2*1*/*2* ditto.

Ten feet to the slope is the height of 15 trusses, 8 inches each; 5 feet the half of ten, from the slope to the top, is nearly the height of 6*1*/*2* trusses at 9 inches each. Fractions in so small a rick is not worth notice.

Now multiply the length by the breadth, and the product by the depth or height.

Trusses. Trusses.

$$10 \times 8 = 80 \text{ trusses.}$$

80 \times 15 = 1200 ditto in the first 10 feet or great body of the rick. Now for the top part:

Multiply 80 trusses, that is the number in length and breadth by 6*1*/*2*, and the product will be 520, which added to 1200 makes 1720 trusses, that divided by 36, the number of trusses in a load, gives 47 loads 18 trusses. Q. E. D.

ON RABBITS.

RABBITS are more beneficial to the meadow and the public, than any other creature in the island.

They feed upon the grass which will not support any cattle, being too dry and short. The drier and shorter the grass is, the better the meat, and the founder, and the more healthy the rabbits, the more they breed and the finer the fur.

Rabbits cannot burrow in good land ; of course, only occupy common soils.

By feeding on good grass, they will not be fleshy, but and watry ; they get fat in frosty and dry weather, and poor in wet and moist weather.

The wild rabbit is much better than the tame one, and all the produce of wild rabbits is clear profit to the public and nearly so to the farmer. They are next to game, as good a dish at table, whether broiled, roasted, baked, fried, or fricassee, made into puddings or pie ; and almost any mode of cookery will make it a ready, easy dish. They are cheap, and within the reach of a poor housekeeper, and cooked with a small fire ; for size they contain more meat than any other animal of its size ; breed every month, take buck a day or two after kindling, and are designed by Providence to supply our wants in a great and luxurious degree.

A doe rabbit in a warren brings at least five venters in the year, that is, breeds five times, and produces generally five at each venter, which on an average are worth nine-pence each, so that a rabbit will yield twenty-five, value eighteen shillings and nine-pence more than a sheep will, with the lambs, on the best keeping, considering the price of the land they feed on.

Every person who has a garden may have a pit dug in it, so as to keep and breed them, and support them with grains, and weeds out of the garden, parings of

turneps, carrots, or potatoes, or bran, raspings, crusts of bread, &c. thrown into the pit, and have them always fresh for table.

To such as wish to have a warren, the following will direct them :

To make an Artificial Warren.

THE lighter or drier the soil is for a warren, the better.

If the land be grass, pare off the turf, of a circle about forty feet diameter, and lay it on, on the outside of the circle, then dig a ditch within the circle, six feet wide at top, three feet wide at bottom, and three and a quarter deep. Let the outside edge of the ditch be cut down perpendicularly; the inner edge sloping; throw the earth you take out into the middle, to form a hill, two or three feet higher than the level of the lawn, the rest should be carted away, then lay down the turf on the hill, and beat it well to settle it.

This ditch, or trench so made, should have two or three pits, drains, or cistpools, with an iron grate, or stones with holes over them, to carry off the hasty rains. In the perpendicular side of the trench should be made or dug out six alcoves, the sides and tops supported by boards, or brick-work, in order to give the rabbits their dry food in, and by their different situations, some of these will be always dry, as you may let into the bank six boxes, or old tea-chests, such as bring the tea from India.

If the ground is light, the perpendicular side of the trench should be lined with mud work, or hurdles staked against it, to prevent the earth from falling in, as the entrance from the top to the bottom of the trench must be by a board or ladder.

If the ditch be only two feet deep, it will give earth enough to form the hill, more then need be carted off. If you are not afraid of having them stolen, paling about a foot high round the circle, will be height sufficient to keep the rabbits in

in; but if you dread thieves, the paling should be high to keep them out.

When the turf is settled and the grass begins to grow, turn in the rabbits, and you will see them immediately begin to burrow in the sides. To keep the turf the neater, bore a score of holes about a foot deep, and if the sides are lined with brick-work, it should be done in arches, so as to leave some part unlined, to let the rabbits burrow in the perpendicular side.

Feed them as other tame rabbits, and in wet weather sprinkle saw-dust at the bottom, which will increase the manure. Take it away once a week. Two or three such warrens on a large lawn before a house is no disagreeable object. The rabbits will feed on the top of the hill.

Should the buck kill the young ones, they should be chained one in each alcove; otherwise they should have their liberty.

After a great snow they will want some assistance early in the morning, because the trench will be filled up, and perhaps the alcoves, where the hay is, may be blocked up.

There should be one buck to eight or ten does, and such a breed should be chose as produce the best skins.

In hatches they breed five or six times a year; and five young ones are to be left to one doe, and the rest killed; but in a warren you cannot get at the young so well. Lucerne, parsley, and carrots, should be always reared for their food. Where hay is given, it should be the best upland pasture; meadow hay is too coarse, and they will waste it.

Forty does may be turned into such a warren, and the produce will be 36s. each doe, £.74: Each worth one shilling with the skin, at ten weeks old. The additional value of the skins in winter, and their dung, will pay for their food and looking after them.

TO MAKE GRASS LAWNS.

LEVEL the ground well, sow it with turneps twice in succession, feed them off on the ground with sheep, then sow the land in August with grass seeds alone. The next year will produce a fine thick sward of herbage, as if it had been laid down many years.

ON THE FEED OF HORSES.

HAVING two acres of grass in the summer of 1797, and not willing to turn them into it, I began to cut it for the use of the stable. In many places it was cut three times over, a good swarth each time, and left at the beginning of August a good lattermath ; three quarters of an acre I made into hay, and had a very good load of it, the rest was cut green and carried into the stable, and from the first day of June to the second week in September, better than fourteen weeks, it kept a cow and four horses. Two of these were frequently at cart, and to these two I gave one quartern of oats each per day, so that in all this time these three horses and a cow were fed, and my work done, for twelve bushels of oats and $1\frac{1}{2}$ acre of grass. The grass worth £. 2 10s. the oats £. 1 10s. together about 4£. not more than about six shillings a week the four. After this I turned out the four horses, in the day, into four acres of lattermath which I bought for two guineas, and brought them into the stable at nights, and fed them there with oat-straw ; to the two that worked I gave half a peck of oats each and this lattermath, kept them in good working condition (not fat, not poor) till the middle of the March following, which was a whole year, wanting ten weeks ; the expences as follows :

		£.	s.	d.
6 acres of after grass		3	3	9
12 bushel of oats		1	10	0
5 quarter ditto		5	10	0
The grass of $1\frac{1}{2}$ acre		2	10	0
		<hr/>		
		£.	12	13
			9	

Thus for £. 12. 13s. I kept a cow for three months, and four horses for better than nine months, at about six shillings a month each.

Horses will eat carrots, potatoes, turneps, and furze, and do well on each. Carrots is universally admitted.

A gentleman of Nottingham has for two months kept fifteen draft horses on turneps, with very little hay, (no corn) in constant work, and they looked plump, and were remarkable healthy. Another has, with the same good effect, kept a larger number of draft horses on the same food, and has saved one hundred and twenty quarters of oats. The mode of preparing the turneps is by cutting off the tops and bottoms, and chopping them in a trough, and then mixing them with cut straw and hay together; at night the horses have a little hay only. In order to induce them to eat turneps at first, keep them rather short of hay and water, and mix the turneps cut small with bran. A horse will eat about half a bushel daily, and an acre will keep six horses four months.

Two horses of mine in the straw yard with a cow, eat turneps as drawn from the field, with the cow, and preferred them to barley straw. Half an acre of moderate turneps kept my cow five months; the value of such an acre, if fed with sheep, £. 2. 0s. if drawn, £. 6.

Sir William Fordyce kept two carriage horses one year wholly on potatoes and hay. They travelled almost every day seven miles, from Wandsworth to London and back, and about town, and kept their flesh well, and looked as sleek as those fed on carrots. They eat a bushel a day the two.

Mr. Johnstone of Hill-house, near Kirk Newton, in Mid Lothian, Scotland, feeds his horses in winter on the shoots of green furze, he uses a machine for bruising them that is used for tan bark. But the late Lord King, of Ockham, Surry, who fed his farm horses the same way, had them bruised on a barn

a barn floor with a flail, to take off the prickles. An acre of furze in the natural state, will keep six horses for four months; but as whins or furze cannot be cut but every other year, two acres will serve six horses for two winters.

With one feed of corn and whins, the horses are kept in as good condition, as with two feeds of corn and straw; so that all the straw and one feed of corn is saved, which valued only at seven pence a day for each horse for seventeen weeks, amount to £. 17 17s. from this deduct the expence of cutting and bruising, about five shillings, and it leaves £. 13 12s. as the produce of two acres of whins £. 6 16s. yearly.

A Composition for curing Disorders, Defects, and Injuries in all kinds of Fruit Trees, by William Forsyth, for which he received a Premium from Government for disclosing the Invention,

TAKE one bushel of fresh cow dung, half a bushel of lime rubbish of old buildings, (ceiling of rooms is best) for want of this, powdered chalk, or common lime after being flaked a full month, half a bushel of wood ashes, and a quarter of a peck of pit, or river sand.

The last three articles are to be sifted fine, before they are mixed, then worked well with a spade, and afterwards with a wooden beater, until the stuff is very smooth, like fine plaster used for ceilings.

To prepare the tree for this plaster, cut away all the dead, decayed, and injured parts, till you come to the fresh sound wood, leaving the surface of the wood very smooth and rounding off the edges of the bark with a draw knife, or other instrument, perfectly smooth, which must be particularly attended to. Then lay on the plaster about one eighth of an inch thick

thick all over the part where the wood or bark has been so cut away, finishing off the edges as thin as possible. Then take some dry powder of wood ashes, mixed with one sixth part of the same quantity of the ashes of burnt bones, put into a tin box with holes like a pepper box, and shake the powder all over the plaster, so as to cover it, letting it remain for half an hour to absorb the moisture. Then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder, till the whole plaster becomes a dry smooth surface.

As the growth of the tree will raise the edges of the plaster next the bark, it should be attended to, and when this happens, the edges should be pressed and rubbed smooth down with the finger, (this is best done when moistened by rain) that the plaster may be kept whole, to prevent the air and wet from penetrating the wound.

Mode of making fine Butter.

THOSE who pride themselves in having excellent butter, will doubtless be pleased with the following observations, the result of studied experience.

The dairy and all the utensils should be kept extremely clean and neat, airy and cool in summer, and not cold in winter.

The cows, if possible, should have access to river water.

Cabbage is the best winter food, and will procure the moist and sweetest milk; but milch cows should not eat the decayed leaves. Carrots and potatoes are likewise good food. Turneps are the worst of all green food, giving the milk a disagreeable taste.

Should the food give the milk an unpleasant taste, put a quart of boiling water into each pan, containing seven or eight quarts of milk, as soon as the milk is brought home, this will sweeten the milk and thicken the cream.

Those

Those who make whey butter, should, as soon as they have skimmed off the cream, warm it over the fire, and then pour it into a pan of cold water. In a short time it will rise, and may be skimmed off, and it will lose in the operation much of its sourness.

The upright churn makes better butter than the barrel churn.

When butter is long coming (as in winter it is apt to be), put a large spoonful of distilled vinegar into the churn with every gallon of cream, after it has been churned about an hour.

One spoonful of the juice of carrots (which may easily be got by pounding them in a mortar and squeezing them through a piece of linen or muslin) put into each gallon of cream at the time of churning, will give winter butter the colour and flavour of spring butter.

Butter should be made twice, if not three times a week. The gentry have theirs made every morning: but those who churn but twice a week in winter, should skim their cream every second day. The cream first got must be put on the fire, and having had a goggle or two, be put into jugs, the second skimming should be mixed with it, and so the third, each time running the whole into another jug, for the sake of better mixing. This lessens the defect arising from the staleness of the cream.

Were persons to attend to these directions, they would find their butter generally good.

The Advantage of a Pidgeon-House, or Dove-Cote.

PIDGEONS are not an unprofitable thing upon a farm. If they are not fed, they will certainly seek their food in corn-fields, during the time the corn is ripening, and alighting

lighting in flocks in particular spots, will beat down the corn, and, in some measure, damage it; but in countries where every farmer has a dove-house, they appoint field-keepers, who attend the crops for a month or six weeks with a gun, fire powder at them, and keep them from settling amongst the corn. In enclosed countries the hedges will tend to prevent this being done; but in open fields it is easily effected. The profit, however, which a farmer draws from them, amply compensates for any little mischief they do. In places where they are not customary, if one farmer keeps a dove-house, he may give offence to others; but in this case, they might be shut up from the middle of July till after the harvest, and fed; the expence would not be great, perhaps two or three pounds; but even this, I apprehend, will not be necessary. Let us consider then the advantages.

To a gentleman, a small dove-cote is pleasant and convenient; to a farmer, a large one is profitable. A dove-house, with upwards of one thousand two hundred nest holes, may be erected for about £30, less where materials are at hand. Such a house may be stocked with eleven or twelve dozen of pigeons, value £1 16s. These are to be taken when full fledged, shut in and fed for about six weeks, after which time, they may be let out, and they will return to their home.

A pigeon lays two eggs, which two always produce a male and female. They continue breeding more or less all the summer. The time to begin drawing or killing is the beginning of February, and may be continued once a week to midsummer. It should then be discontinued till after harvest, the young at this season being suffered to fly and keep up the stock, lost by accidental death, or a wanton

wanton gun, for a farmer must not expect but that some of them will occasionally be shot, when at a distance from home.

Such a dove-house, with luck, will produce one hundred dozen of pigeons per year. Those killed before harvest, are the first flight; those after the harvest, the second. The first flight will fetch three shillings and six-pence a dozen; the second, two shillings and six-pence, contracted for at the place, that is three shillings a dozen on an average. The dung in this house will produce one hundred and fifty bushels a year, worth seven pence a bushel, if sold, filled in lightly; but if used upon the land; sowed as a top dressing, after the seed is harrowed in, at the rate of eight bushels per acre, is worth to the farmer two shillings and six-pence a bushel; for twenty shillings worth at this price, will crop an acre for one year. Some spread a greater quantity; but it makes the land too rich, and the crops of corn too rank. According to this estimate the profits are:

	L. s. d.
100 dozen, at 3s.	— — — 15 0 0
150 bushels manure, at 2s. 6d,	— — — 18 15 0
	L. 33 15 0

Note. A pigeon eaten in a farmer's family is more worth to him than three pence.

In wet seasons, pigeons are apt to neglect their young, and many will be found dead in their nests; possibly it may be worth while to give them a little food in very wet times in summer.

If pigeons do not breed well, the dove-house may be over-cocked, that is, have too many cocks; in this case, a dozen or two of cocks should be killed from them, and should there, after this, be any want of cocks, the hens will

soon

Soon find mates from the dove-houses in the neighbourhood, and induce them to their own home.

To increase the quantity of dung, the stubble should be cut, and occasionally scattered over the floor of the dove-house, this will imbibe that nutritious property of the dung, which would otherwise evaporate, and increase the quantity. By frequent scattering, the floor will get bulky. In this case, it should be removed, and thrown upon a heap without, by the dove-house, in the shady or north-side, and a fresh quantity be suffered to collect. It would be better if the dung-hill could be under cover, or covered with straw; perhaps dung from the farm-yard may do, that is, to keep it from being too much dried in the sun. But if the farmer would order his maid to collect the urine of the family in a pail, and throw it daily over this heap, it will add considerably to its strength, keep it moist, and he would find his account in it. It thus, possibly might dress the land for two years. Twenty pounds a year may be no great object to a farmer; but, besides the accommodation to his table, even little in the way of gain, is worth his attention. Pigeons pick up the seeds of weeds, and clean the land, and richly deserve the little corn they destroy.

To make the most of Ground.

IT is better to have a succession of crops, than to let any one crop continue long on it; provided you can dress the ground well and keep it in heart.

Potatoes planted early in March, in ground well dressed, dibbled in rows fifteen inches between plant and plant, and eighteen inches from row to row, the plant to consist of two eyes, and put five inches under ground, will produce a good crop

CROP. Mark the dibber and push it down to the mark, that the plants may be all of one depth.

To mark the rows equally distant, fix two harrow tines in a frame or board, and straining a line across the field, let a boy walk on the line and draw the frame, and the tines will mark the rows: at the second drawing, one tine should be drawn in the tine, made by the line before, and the second tine will mark the next row. If hoed when two inches above ground, and again a month after, and hoise hoed or dug between the rows, the crop will yield from four hundred bushels to eight hundred, according to the goodness of the soil, each bushel 5lb. that is, from ten tons to twenty tons, and more.

The crop may be taken up in August or the beginning of September, when potatoes will fetch three shillings a bushel, and the ground may be dressed and planted with Savoys. These should be raised in a seed, by sowing the seed the first or second week in May, and they will be ready to plant the first showery weather, after the potatoes are removed. The largest plants should be put at eighteen inches distance each way; these will cabbage in December and continue to February, when they should be cleared off for another crop of potatoes.

	L. s. d.
400 bushels of potatoes, at 3s.	— — 60 0 0
One acre of Savoys, at $\frac{1}{2}$ penny	— — 38 15 0
Produce of one acre, £. 98 15 •	<hr/>

Comparative Estimate of the Profits of a small Farm, between keeping it in Till and growing Corn, &c. and laying it down in Grass, and making it a Dairy Farm for Butter.

FARMERS cannot live now on small farms, unless they make five rents yearly; that is to say, unless the annual produce

duce amounts to 5 times the rent. Let us now take a farm of 80 acres of tolerable good land. On such a sized farm, it is impossible a farmer can keep a team, unless he is his own carter, and goes out to job-work at times.

Let his rent then be 16s. per acre — *f. 64*

Tithe 4s. Taxes 5s.

The team with wear and tear, a man and a boy

Learned too New York and I am not up to his ~~standard~~

Now I will suppose this land shall produce 3 rents and a half, after he has paid seed, labour, the working, threshing, selling, &c, equal to 1 rent — 224.

But let these 80 acres be laid down at the beginning of his lease, or indeed almost at any time during the lease; (for I shall shew that the expence of laying down is paid by the first crop) I say, let these 80 acres be laid down in grass, and the profit will be considerable.

To save room here, I will refer to the estimate, I have made in page 86, where, supposing 47s. to be paid for tithe and rent of an acre of good grass, such as yields a load and a half per acre, I have shewn that the profits of a cow, her milk made into butter, will produce 10l. 3s. 6d. Taking it then on this estimate, the profit will be as follows:

80 acres of grass at $2\frac{1}{2}$ per cow, will keep 16 cows, the clear profits of which, by the estimate there given, will be sol. 3s. 6d. per cow or $\frac{1}{2}$ 162 16 Difference in rent between 47 and 20s. rent

and tithe here being only 20s. an acre — 108 0 0

Deduct 32 loads of wheat straw to be bought to litter the cows, for dressing, at 18s. per load 25 16 0

Profit £.245 0.0

11

Hence then it appears, that 245l. profit may be made on a farm of 80 acres; and that whether the farmer is at the beginning of a lease, or within a few days of its expiration, it is his interest to lay it down in grass, if he is in any reach of a market to sell his butter, without long carriage, especially when the first crop of the land, if rightly managed, will pay the expence of laying down. He need not purchase his stock of cows till the end of the summer. This stock will cost him, suppose 16 cows at 10l. each, 160l.

	£. s. d.
Rent, taxes, and tithe, per acre	1 5 0
Three ploughings, paid for at 10s.	1 10 0
Three harrowings, large and small, at 2s.	0 6 0
Seeds to lay it down	0 7 6
Draining	0 1 6
Mowing two crops	0 4 6
Making hay twice	0 10 0
Carting to barn, 2½ loads; clover, 2 crops	0 6 0
	4 10 6
Two loads and a half of clover hay, at 3l.	7 10 0
Profit per acre, of	2 19 6
Acres	6 80
	£.238 0 0

But if this land was laid down with barley or oats, the grain would pay for the ploughings and harrowings, and the profits on the hay would be more.

This mode of farming is attended with no bad seasons, no bad harvest, nor the slavish attendance on a corn farm. The business is half transacted by the wife, and the fields are always agreeable, and an ornament to the house.

J. T.

On Green Food for Cattle.

A GOOD crop of Lucerne produces, if eaten green, 32 tons weight per acre: Cabbages (two crops, one succeeding the other)

other) 50 ton per acre; Carrots 20 tons; Turneps 30 tons, per acre.

One such acre of Lucerne will fatten, in 20 weeks, six bullocks, weight $4\frac{1}{2}$ Cwt. or 76 wethers, of 80 lb. weight each
Cabbages ditto, 5 bullocks, &c. or 53 wethers, &c.

Carrots almost 2 ditto, or 32 ditto

Turneps, ditto 2 ditto, or 24 ditto

A fatting bullock, weight $4\frac{1}{2}$ Cwt. will eat daily of green

Lucerne 1-6th of its weight, or 84 lb.

Carrots 1-4th ditto 126 lb.

Cabbages 3-8ths ditto 129 lb.

Turneps 1-half ditto 252 lb.

Notes. All cattle eat more at first, than they do when near fat.

Capt. Middleton, of Telston, near Maidstone, has made the following observations on the feed of oxen.

He says, that one ton weight of hay will go as far as either of the following :

Eight tons of turneps, the roots only, as we find them in winter.

Eight and a half of ditto, in spring or autumn, with the green tops.

Six ditto of Scotch cabbages.

Three ditto of carrots.

Note. A bushel of carrots weighs 28 lb. These are sold in the field from 4d. to 8d. per bushel, say 6d. that is, 2s. the Cwt. or 40s. the ton.

If Cwt. of Linseed oil-cakes at 5l. the 1000, is as profitable as hay at 2l. 2s. the ton; but oil-cakes are sometimes 8l. the 1000 and more.

On the Feed of Hogs.

HOOGS will fatten on potatoes and mazagen bean meal, in the proportion of one and a half bushel of meal to 10 bushels of potatoes, boiled and mashed; but as it will take three months to fatten them, and 25 hogs will eat the above quantity daily, rating the potatoes at 1s. a bushel, they will have eaten as much when fat, as they will sell for: of course there is no profit but in their dung, and the price of the potatoes grown by the farmer who fattens them; and as 400 bushels is a common crop, that is 20l. per acre produce, which is perhaps 10l. more than he can make of crops in general. The dung will be about 12 loads, value 3l. 12s.

Hogs fattening on mazagen beans, will not readily eat grey peas.

ON POULTRY.

TURKEYS and fowls, on an average, when dead, weigh $\frac{2}{3}$ of their weight when alive. Thus a turkey that weighs 21 lb. alive, will weigh 14 lb. when dead; and a fowl that weighs 3 lb. alive, will weigh 2 lb. when dead.

Poultry about grass land, soon taint the land, and will die away at about six weeks old. To prevent this, the breed should be changed every three or four years.

ON SHEEP.

DORSET sheep should be put to ram in July or August, others in September and October: they go 21 weeks. The ram should be changed every two years, from some other stock, bot of the same breed.

In folding, a square yard is allowed to each sheep; but in some countries they are folded two nights in one place. Three hundred sheep, will fold 261 yards, in one night. In dry countries sheep are folded all the year round.

Folding

Folding sheep on arable land impoverishes the land where the sheep are fed. They should be folded on the same land; for on Wiltshire Downs, where each farmer has as much arable land as down, and folds upon the ploughed ground, two acres of this, *i. e.* one of arable folded and one of down not folded, are not more in value than one acre of down, on which sheep are folded.

It is a mistaken notion that the larger the flock folded together, the better. The reverse is the truth: the lambs suffer by it; the food is wasted, and the whole flock worse in proportion to its size. By dividing a large flock, it will require more time to fold a piece of ground; but the food will go further, and will pay for the extra shepherds.

Sheep are much damaged by *all* driving and folding; they never fold fat sheep, and why? Because it tends to make them lean, it must of course make poor sheep poorer.

Sheep are shorn at Midsummer; the shorter the wool the dearer.

If farmers have not sufficient land, they put out their lambs from Michaelmas-day to Lady-day, at two shillings and six-pence, or three shillings a head.

In mountainous countries they make butter and cheese from the milk of sheep. Sheep with black horns, or with a blackish belly, are little worth. They never fatten well. This is the observation of a butcher, who remarked it for years.

The black faced breed of sheep, the Norfolk, not the South-downers, Mr. Coke of Norfolk, from long experience, has found very unprofitable. It is an invariable rule with him, not to turn them into turneps after March, owing to the damage arising from the flow of milk the turneps give in Spring. He feeds them on Sainfoin hay, which yields milk enough for the lambs. Before winter he dresses all his flocks, as a guard against ticks and lice, with the following: 2lb. of

tobacco

tobacco, 2lb. of soft soap, 1lb. of white mercury ground to powder, boiled one hour in eight gallons of water. Part the wool once down each shoulder and the breast of the sheep, and twice along each side, into which pour it. This quantity is enough for sixty sheep.

When mutton is five pence, a lb. a live sheep should, and will, sell for two pence three farthings; the dead sheep, as bought by the butcher, is, on average, half the weight of the live sheep; the odd farthing is out of the butcher's fifth quarter, which he can very well afford to pay; this is the customary price in Kent.

On suckling Lambs, as practised by Mr. Ducket, of Esher.

Mrs. Ducket sends five hundred sucklers to market yearly. Their diet is milk, chalk and straw. Chalk is given to make them white. The best breed for this purpose is the Dorsetshire, they weighing from ten to eleven stone (8lb. each stone) or about 20lb. a quarter. The lambs at eight weeks old, average from 6 to 12lb. per quarter.

Old ewes will produce lambs equally as good as young ones; but those of two or three years old, are allowed to hold their milk much better. When ewes are broken mouthed Mr. Ducket sells them. He is always ruled by teeth, not by age. The most difficult time of the year for covering is May and June; but it is of the greatest importance, that this business should take place at this time, it making a difference of more than seven or eight shillings in the value of the lamb, the great object being to force them for the Christmas market. Those ewes that turn out the best Christmas sucklers, are of course allowed to be the best dams.

The method of suckling is as follows: They are allowed to suck every four hours, except at eight or nine o'clock at night, to give them time to digest their meal; till

till four in the morning, during which time the lambs and their dams are put and left together. At four in the morning they are suckled, and then separated, and the lambs put in a pen by themselves, with straw and chalk to nibble. At eight they are suckled again, alternately sucking every four hours, their own dams and a strange or bastard ewe. Many suck two or three different ewes. The ewes are bought in November and in Spring. Such as are bought in Spring are turned into rye, tares, or grafts. The general price from twenty-four to twenty-five shillings.

The suckling houses have every accommodation. Distinct pens are made for the lambs adjoining the interior sides of the suckling-house, and the centre compartments are allotted for the ewes.

At the time of suckling, a man or a boy holds the ewe by the horns, whilst the lamb sucks its fill. When one lamb is finished, it is put into a pen by itself, and the ewe or ewes, into another by themselves, and so on, till the whole process is completed, which is repeated every fourth hour.

At four in the morning, before the dams are turned out to green food, grains, hay, malt-dust, and pollard, are given; that by eating this dry food, their bellies may be partly filled before they are turned out. It requires a man and a boy in constant attendance to one hundred lambs.

On Sheep-feeding of Beans.

THE farmers in Cambridgeshire, Huntingdonshire, and other places, have found that sheep feeding on beans is a good method of keeping them clean.

To this end they are turned in, in the day-time, from the time the plants are about eight inches high, and continued in till

till the beans are in bloom. At first they will nip off a head or two, but the bean stalk being bitter, they will not eat them, but drop them, and knowing the taste, will nip off no more, but eat the weeds between them and keep them from feeding, so that the land, on being ploughed, will be clearer the next year.

Sheep walking gradually and quietly through the crops damage it very little, and even if they lie down occasionally, and bend it down, it will rise again; but, to allow for any little damage, they may be sown a little thicker. By this mode of feeding them clean, beans increase in the crop nearly two to one. A field of beans, all circumstances alike, that produced seventeen quarters; when sheep fed, produced twenty seven quarters. Beans in such feeding, will forward lambs, and help ewes much in their milk.

These farmers take out the sheep when they begin to blossom, fearing they will eat the blossoms. This should be examined into. I do not think they will, for wild oats are of fast growth, and may rise and feed, between the time of blossoming and harvest.

Should sheep be found to nip off the heads at first turning in, it would be well to turn them into other feed in the evening. To take off the edge of their appetite, they might lie among the branches of trees that have been cut off.

Remarks on Pigs.

IN winter time it is best to sell off the pigs, whilst suckling, at three or four weeks old, at four shillings each.

Never begin to wean till March, and leave off in July.

A high, dry, clean situation is every thing for pigs. It makes them healthy, and well even in wet seasons. They should never lie on horse dung.

Forty-six weaned pigs, from nine to eleven weeks old, will eat daily three pecks of barley meal, worth two shillings and ten-pence, that is nineteen shillings and six pence a week, or about five pence a week each.

Seventy hogs fatting in four months, made one hundred and six loads of dung a month, at six shillings per load, about £.32, if sold.

Sows of the Chinese breed will take boar three weeks after farrowing. The pigs may suck two months after this, and will then stand to hogging. They should be weaned at a week old.

Pigs should lie clean and have room, otherwise they will be srye baked, that is, scurfy and scabby with filth. In this case, they should be twice a week scrubbed with a brush and soap and water, or wood ashes, and that till they are clean and well.

To bring up Turkeys.

AS soon as hatched they should be dipped in cold water, and a pepper-corn put down the throat of each.

They shonld never be exposed to rain for the first six weeks. The hen should have a house something like a dog-kennel, with a coop or latticed place before it, where she may come out, and take the air and feed. When it rains, she will retire with her brood.

The young should be fed for six weeks with hot food, such as young onions or chives, chopped up with eggs. They will eat addled eggs, if boiled, and they will not hurt them.

After six or eight weeks the hen and young may have their full run.

ON MEASURING OF TIMBER.

THE subject of this chapter is rather out of the line of farming; but the work being calculated for the use of country gentlemen, such may occasionally have timber to sell, and to such, the method of measuring it may be acceptable.

Timber is paid for by the cubical foot; and, to get at the exact dimensions, they take the girth, or measure the circumference in the middle of the body of the tree, between the root and the part where it forks or branches off. Should there be a swell in the middle, the buyer is at liberty to take the girth in any place nearer the root.

The girth thus taken, four inches are allowed for rind, and a fourth part of the remaining number, of which the girth consists, must be first multiplied by itself; the product in inches must then be multiplied by the number of feet, of which the length of the body of the tree consists, and this product, being divided by 144, the cubical inches in a foot, gives the true cubical feet in the tree.

What are the cubical feet in a tree 17 feet long, whose girth is 9 inches? Answer, as below, 9 feet 6 inches.

Multiply	9	Inches girth
by	9	
Multiply the product	81	Inches
by	17	feet, the length,
	567	
	81	
	567	feet inches
Cubical inches 144)	1377	(9 6
The half of 144	1296	
is	72) 81 (1 half foot, or 6 inches
		72

9 This remainder, if further divided, would give a fraction, which is not necessary.

The

The top of the tree is generally given to the purchaser, for cutting it down, and carrying it away.

All under 6 inches in the girth is accounted top, and not timber.

Where there is a fork above 6 inches in girth, one of the prong pieces only is reckoned in the length.

Fifty solid or cubical feet, is called a load.

No part of a tree that is not sound, is measured into the length.

Gunter's sliding rule is that by which timber is measured. This rule, with a book of explanations, may be bought at any mathematical instrument-maker's.

Crab-tree is worth 1s. a foot, or — 50 0 a load.

Pear-tree about 7d. a foot — — 29 2 a load.

Elm is worth about — — — 36 0 a load.

Cherry-tree is worth a shilling a foot.

Oak ditto, but is the more valuable, according to the bend of the timber, as it will serve for ship-work.*

Every country carpenter knows the price of timber, which varies according to the situation of the place, and distance to be carried.

Forty yards of bark, 3 feet and a half high, set up against poles, is called a load, and is worth about 35s. or 40s. The price of barking about 12s. a load.

This was the price about 10 years ago.

* These prices were in 1790. They are now higher.

F I N I S.

ERRATA.

Page 65, line 8, for hurt, read *bove*.

— 24, for grass, read *grow*.

— 38, — 2, for 15 3 6, instead of 9 3 6, read 16 3 6,
instead of 10 3 6.

— 6, for 15 3 6, read 16 3 6.

— 89, — 10, after keeping, read *them*.

— 92, — 5, for heads, read *breasts*.

— 14, for *vanes*, read *veins*.

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